Remedial Action Report
Jones Road Ground Water Plume Superfund Site
Harris County, Texas
EPA Identification No. TXN00605460

EPA Region 6 Remedial Action Contract 2
Contract: EP-W-06-004
Task Order: 0129-RARA-06NK

Prepared for
U.S. Environmental Protection Agency
Region 6
1445 Ross Avenue
Dallas, Texas 75202-2733

Prepared by
EA Engineering, Science, and Technology, Inc., PBC
405 S. Highway 121
Building C, Suite 100
Lewisville, Texas 75067
(972) 315-3922
Texas Registration No. F003896

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ATTACHMENT

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LIST OF ACRONYMS AND ABBREVIATIONS

bgs	Below ground surface
CQAP	Construction Quality Assurance Plan
DCE	1,2-dichloroethene
EA	EA Engineering, Science, and Technology, Inc., PBC
EPA	U.S. Environmental Protection Agency
ft	Feet/foot
FM	Farm-to-market
HSP	Health and Safety Plan
ISB	*In-situ* bioremediation
NPL	National Priority List
PCE	Tetrachloroethene; perchloroethylene
PPE	Personal protective equipment
PRB	Permeable reactive barrier
QA	Quality assurance
QC	Quality control
RA	Remedial Action
RAC	Remedial Action Contract
RI	Remedial Investigation
ROD	Record of Decision
ROW	Right-of-Way
SAP	Sampling and Analysis Plan
SHSO	Site Health and Safety Officer
Site	Jones Road Ground Water Plume Superfund Site
TCE	Trichloroethene; trichloroethylene
TCEQ	Texas Commission on Environmental Quality
TOM	Task Order Monitor
WBZ	Water-Bearing Zone

1.0 INTRODUCTION

The U.S. Environmental Protection Agency (EPA) has authorized EA Engineering, Science, and Technology, Inc., PBC (EA) under Remedial Action Contract (RAC) No. EP-W-06-004, Task Order No. 0129-RARA-06NK, to implement the focused Remedial Action (RA), i.e. *in situ* bioremediation (ISB) of the Shallow Water-Bearing Zone (WBZ), at the Jones Road Ground Water Plume Superfund Site (Site), which is located in the northwest portion of Harris County, Texas. EA executed this RA for the Site as defined in the September 2010 *Record of Decision* (ROD) (EPA 2010) and in accordance with the RA Work Plan dated August 2015 (EA 2015a).

The initial RA Report Revision 00 (EA 2016b) was submitted on September 2016, and included the limited ISB conducted from 26 January to 1 February 2016. This revised RA Report (Revision 01) incorporates hot spot ISB treatment conducted in January 2018 as well as groundwater monitoring results since the initial limited ISB. The results of limited ISB and subsequent work and performance assessment are attached in an updated Technical Memorandum on Results of Limited In Situ Bioremediation which is attached to this report.

1.1 REPORT ORGANIZATION

The organization of this RA Report was based on the EPA guidance document, *Close Out Procedures for National Priorities List Sites* (EPA 2011), and includes the following information:

- Section 1 – Organization of this RA Report, general site description and background, and the regulatory history, including information on the RA objectives and the selected remedy outlined in the ROD (EPA 2010).
- Section 2 – Construction activities conducted as part of the RA.
- Section 3 – Chronology of events.
- Section 4 – Performance standards and the quality control (QC) and quality assurance (QA) steps taken to verify that the requirements of the ROD were satisfied.
- Section 5 – Inspections performed and health and safety aspects of the work.
- Section 6 – Operational dates.
- Section 7 – Operations and maintenance.
- Section 8 – Contact information for the major design and remediation contractors, EPA Task Order Monitor (TOM) and Texas Commission on Environmental Quality (TCEQ) project manager.

- The references cited in this report follow Section 8. All figures and tables cited in this report immediately follow the body of the report. In support of this RA Report, Attachment 1 presents the Technical Memorandum on Results of Limited ISB.

1.2 SITE DESCRIPTION

The Site is located in the northwest portion of Harris County, Texas (Figure 1). The source of contamination is the former Bell Dry Cleaners facility, which was located within the Cypress Shopping Center at 11600 Jones Road, approximately 0.5 miles north of the intersection of Jones Road and Farm-to-Market (FM) 1960, outside the city limits of northwest Houston, Texas. The Cypress Shopping Center was constructed in 1984, and the former Bell facility began dry cleaning operations sometime in 1988, using perchloroethylene (PCE), also known as tetrachloroethene. The former Bell facility continued operating through May 2002 when the dry cleaning operations were shut down. The hazardous substances present at the Site include PCE and related daughter products trichloroethylene (TCE), cis-1,2-dichloroethylene (DCE), and vinyl chloride.

The area around the Site includes residential, commercial, and light industrial development. Residential development has been active since the 1960s, effectively eliminating wildlife habitat from the area. Jones Road is the principal north-south corridor through the area, and FM 1960 (approximately one-half mile to the south) provides a southwest-northeast transportation corridor. Commercial development is dominant along Jones Road with residential and limited commercial development along the side streets. Cypress Creek is located approximately one mile to the northwest of the Site, and White Oak Bayou is located approximately 3,500 feet (ft) to the south.

1.3 SITE BACKGROUND

The Site has undergone numerous investigations beginning in 1994 and continuing through 2008; it was proposed to the National Priorities List (NPL) on 30 April 2003, and was finalized to the NPL on 29 September 2003. From August 2003 through May 2008, the TCEQ's state-lead contractor performed a remedial investigation (RI) and feasibility study at the Site, which characterized the nature and extent of constituents of concern present in environmental media. During the RI, 19 monitoring wells were installed across the area of the Site (Figure 2). Soil, groundwater, and vapor intrusion samples were collected for analysis, and a bench-scale treatability study was completed to evaluate the application of *in situ* chemical oxidation and bioremediation treatment technologies. Routine quarterly groundwater sampling was also performed.

Homes in the area have private water supply wells, and some wells are shared between multiple homes. From January through November 2008, EPA conducted a time-critical removal action that included the installation of a water line and connections to homes and businesses at the Site. The water line service area is shown on Figure 1. Approximately 51 percent of the well owners agreed to discontinue use of their water wells and begin using water from the water line. The remaining 49 percent of the well owners declined to participate in the water line project and continue to use their private water supply wells. The White Oak Bend Municipal Utility District services the water line.

The ROD was signed on 23 September 2010 and sets forth the selected remedy. There is only one planned operable unit for the Site and the selected RA is intended to address all areas of concern. The selected remedy is Alternative 4, *In Situ* Enhancements to Pump and Treat (EPA 2010). The *in situ* treatments involve treating the soil and groundwater in place. In June 2012, an ISB pilot test was executed at the site in order to refine the remedial design. Baseline sampling was conducted, followed by injection of EHC-L® into the deep WBZ and shallow WBZ. Four post-injection sampling events were conducted at one month, three months, six months and three years after injection. Based on the results from the pilot test, limited ISB has been performed and is the focus of this report.

1.4 ENVIRONMENTAL SETTINGS

The Site is located in northwest Harris County, on the Gulf Coast Plain. This physiographic province is characterized by nearly flat topography that gently slopes toward the Gulf of Mexico at approximately five feet per mile or less. Most of the coastal area is low-lying and drained by meandering bayous and sloughs.

Surface water drainage is managed primarily through open roadside bar ditches. Drainage generally flows into the ditches, then to drainage ways that flow south to White Oak Bayou. White Oak Bayou flows southeast into downtown Houston where it enters Buffalo Bayou. Buffalo Bayou flows through the Houston Ship Channel toward Galveston Bay and then to the Gulf of Mexico.

The local geology to approximately 400 ft bgs consists of clay, sand, and silt consistent with the fluvial depositional environment. The subsurface geology consists of Lissie Formation, which is underlain by the Willis Sand, which is underlain by the Goliad Formation and Fleming Formation. The principal water-bearing strata at the Site are the Chicot Aquifer, composed of the Lissie Formation and Willis Sand, and the Evangeline Aquifer comprised of the Goliad Sand and Upper Fleming Formation.

Beneath the Site, groundwater is present within two intervals of the Chicot Aquifer: the shallow WBZ encountered at around 20 to 30 ft bgs, and the deep WBZ encountered around 110 ft bgs. A 50-ft interval of dewatered Chicot Aquifer now separates the perched shallow WBZ from the deep WBZ.

The shallow WBZ is comprised of a silty sand to sandy silt that is interbedded with sandy clay and clayey sand. The shallow aquifer is underlain by clay that is present from approximately 35 to 60 ft bgs. The groundwater flow within the shallow aquifer is toward the south at a gradient of 0.02 ft/ft.

The deep WBZ is present in a poorly graded, very fine-grained sand that is interbedded with silty and sandy clay and clayey sand. The clay beds are generally less than 10 ft thick, but locally they retard the vertical movement of water. Therefore, the saturated sand beds commonly have different hydraulic heads within the vertical profile (Gabrysch 1984).

1.5 COMPLETED SCOPE

The completed scope described in this report includes the following tasks:

- Site preparation activities conducted:
    - Set up of temporary facility and staging area
    - Access agreements and coordination with property owners
    - Utility location

- RA field activities conducted:
    - Baseline groundwater sampling
    - Full scale injection of EHC-L® and bacteria at 63 ISB injection points (Revision 00)
    - Site restoration
    - Post-injection groundwater sampling
    - Hot spot injection of EHC-L® at 10 ISB injection points (Revision 01)
    - Post-injection groundwater sampling
    - Site restoration

Subsequent sections detail the tasks performed to complete the scope of work.

2.0 CONSTRUCTION ACTIVITIES

Construction activities included site preparation, mobilization, injection, site restoration, baseline and post-injection sampling. Attachment E of Appendix A includes field notes and Attachment F includes photographic documentation of field activities. Figure 14 of Appendix A shows the approximate locations of the injections. Section 3 summarizes the chronology of RA activities.

2.1 SITE PREPARATION

The following sections describe site preparation activities, the temporary facility and staging area, access agreements, and utility locates.

2.1.1 Temporary Facility and Staging Area

The Cypress Shopping Center parking lot was used as a temporary facility and staging area. An exclusion zone was set and maintained around the chemical staging, mixing and injection locations.

2.1.3 Access

Prior to initiating any work at the Site, an access agreement was obtained to all properties where work was conducted. EA staff coordinated with the property owners and identified the proposed ISB injection locations.

2.1.4 Existing Utility Locates

The project area includes roadway rights-of-way (ROWs) and private commercial properties where subsurface injections were conducted. Prior to commencing work, the subcontractor called 811 to obtain ROW and property perimeter location services. A private utility locator then cleared all known and unknown lines using the most appropriate combination of techniques and facility-specific information regarding buried utilities and transmission pipelines. All utilities were located, visibly marked, and identified according to the type of utility.

2.2 REMEDIAL ACTION FIELD ACTIVITIES

The RA activities included pre-injection groundwater sampling, limited ISB injection at 63 points and hot spot treatment at 10 points, and subsequent post-injection groundwater sampling. A chronology of site RA activities can be found in section 3.

All work was performed in accordance with the RA Work Plans (EA 2015a, 2016a), Sampling and Analysis Plan (SAP) (EA 2016c), Health and Safety Plan (HSP) (EA 2015b), and Site Management Plan (EA 2015c). Documentation of the RA field activities related to the pre-injection sampling, injection of the ISB amendment, and post-injection sampling are included in the *Technical Memorandum on Results of Limited ISB* in Appendix A.

2.2.1 Management of Investigation Derived Waste

Purge water generated during the groundwater sampling events was properly containerized, profiled and disposed of as non-hazardous waste. Construction debris was properly disposed of.

2.3 DEVIATIONS

There were no deviations from the work plan.

2.4 EVALUATION OF INJECTION AND SAMPLING DATA

Evaluation of groundwater sampling data is documented in the *Technical Memorandum on Results of Limited ISB* in Appendix A.

2.5 SITE RESTORATION

After each injection event was completed, boring locations were backfilled with bentonite and patched with concrete to match the existing surface. Any spilled product was vacuumed up and used for re-injection after being screened for solids and debris.

3.0 CHRONOLOGY OF EVENTS

This section presents the chronological order of events associated with the focused RA, and ISB of the Shallow WBZ. The relevant milestone activities are listed below.

Activity	**Dates**
Injection Pilot Test	5 June 2012 – 6 June 2015
Pre-injection sampling	30 November – 3 December 2015
ISB Injection Event	22 January – 2 February 2016
Post-injection sampling	19 – 22 April 2016
Post-injection sampling	20 – 22 September 2016
Post-injection sampling	21 – 23 February 2017
Post-injection sampling	11 – 13 September 2017
ISB Hot Spot Injection Event	27 – 29 March 2018
Post-injection sampling	14 – 17 May 2018
Post-injection sampling	05 – 07 November 2018

4.0 PERFORMANCE STANDARDS AND QUALITY CONTROL

The Construction Quality Assurance Plan (CQAP) (EA 2015d) details the approved construction QA, construction QC plans and procedures. Construction activities carefully adhered to the plans and procedures identified in the CQAP.

The SAP (EA 2016c) identifies the QC requirements related to water sampling. The objective of this portion of the RA was to inject EHC-L® and bacteria to biodegrade site contaminants with the potential to impact the underlying Lower Chicot drinking water source; principally PCE and degradation products TCE and DCE. Analytical data was analyze in accordance with the measurement quality objectives outlined in the SAP (EA 2016c).

4.1 QUALITY CONTROL AND ASSURANCE ACTIVITIES

To ensure that the injection of the ISB amendment followed the work plan and was achieved on schedule, EA maintained a site manager onsite throughout all activities associated with this RA.

4.2 DATA VALIDATION

The analytical data associated with samples collected in November 2015, April 2016, September 2016, February 2017, September 2017, May 2018, and November 2018 were validated. The validation reports are included in Attachment B of Appendix A.

4.3 DOCUMENTATION

Field activities and sampling tasks were documented at the time of execution as discussed below.

4.3.1 Field Documentation

Bound field logbooks were maintained by the EA site manager and team members to provide a daily record of significant events and observations. Logs for field batch-mixing, injection quantities, and injection timeframes were maintained during the injection event. In addition, water level gauging and baseline sampling activities (purging quantities, parameter stabilization, low-flow sampling, etc.) at all wells were recorded on field data sheets.

Populated data sheets and field logbook entries are provided in Attachment C and E of Appendix A, respectively.

4.3.2 Photographic Record

A project photographic record was kept as part of the RA ISB field activities. Attachment F of Appendix A provides photographic documentation of injection activities. The EA site manager and field staff used digital cameras to create the photographic record.

5.0 INSPECTIONS

This section addresses activities and issues associated with completing the limited ISB RA at the Site. Section 5.1 discusses the pre-final and final inspection and Section 5.2 discusses site health and safety.

5.1 PRE-FINAL AND FINAL INSPECTION

No pre-final or final inspection was conducted.

5.2 HEALTH AND SAFETY

Site-specific health and safety procedures were implemented during the limited ISB RA at the Site in accordance with the HSP (EA 2015b). These procedures were designed to protect the health and safety of workers and visitors while present at the Site and were enforced by EA's site health and safety officer (SHSO) during the limited ISB RA activities. The following sections discuss levels of protection, hazard evaluation and control, health and safety meetings, and health and safety incidents.

5.2.1 Levels of Protection

The personal protective equipment (PPE) requirements were set at Level D, consisting of coveralls or work clothes, safety-toed boots, hard hat (as needed), safety glasses, high-visibility reflective vest, hearing protection (as needed), leather gloves (as needed), and nitrile gloves (as needed) for all site activities.

5.2.2 Health and Safety Training

The SHSO and the site field personnel were trained, as required, to meet the requirements of the U.S. Department of Labor, Occupational Safety and Health Administration Standard, 29 Code of Federal Regulations 1926.65, *Hazardous Waste Operations and Emergency Response* and qualify as hazardous waste site workers. Onsite management and supervisors who were directly responsible for hazardous waste site workers received at least an additional eight hours of specialized supervisor training.

5.2.3 Health and Safety Meetings

All personnel on-site, including EA and subcontractor employees, attended mandatory daily health and safety meetings, which were conducted by the EA SHSO or a designated alternate. Protocol and emergency response procedures established in the HSP (EA 2015b) were discussed prior to construction activities and all personnel were required to read the HSP and sign the compliance agreement. Daily safety meetings usually began with a brief synopsis of planned activities and identification of any physical, chemical, or biological hazards associated with those activities. Other topics discussed each morning included PPE requirements, emergency procedures, proper communication skills to be used to prevent accidents, emergency contacts, location of emergency telephone numbers, first aid kits, and the route to the nearest hospital. All participants at the daily health and safety meetings were required to sign the attendance log kept by EA's SHSO.

5.2.4 Health and Safety Incidents

No health and safety incidents occurred.

6.0 OPERATIONAL DATES FOR LIMITED ISB REMEDY

The limited ISB remedy became operational immediately after injection was completed to establish the permeable reactive barrier (PRB). A PRB is a subsurface wall of reactive material that treats groundwater as it passes through. Treatment commenced immediately following injection, and therefore the PRBs were operational at that point. Optimal treatment within the PRB is expected to occur once the bacteria culture population reaches maximum size.

Injection	Operational Date
Injection	1 February 2016
ISB Hot Spot Injection	27—29 March 2018

7.0 OPERATION AND MAINTENANCE OF ISB REMEDY

There is no scheduled operation and maintenance required as part of the ISB RA activities; however, sampling of site wells is necessary following injection to monitor groundwater conditions and to assess progress of the remedy. Maintenance of the groundwater pH will be assessed to ensure optimal conditions for bacterial growth.

8.0 CONTACT INFORMATION

The EPA TOM was:

Raji Josiam
U.S. EPA Region 6
1201 Elm Street, Suite 500
Dallas, TX 75270-2102
(214) 665-8529
josiam.raji@epa.gov

The TCEQ Project Manager was:

Marilyn Long
Texas Commission for Environmental Quality
Remediation Division (MC-136)
12100 Park 35 Circle, Building D
Austin, TX 78753
512-239-0761
Marilyn.Long@tceq.texas.gov

EPA used the following contractor for oversight and implementation of the limited ISB RA:

EA Engineering, Science, and Technology, Inc., PBC
405 S. Highway 121, Building C, Suite 100
Lewisville, TX 75067
972-315-3922

Contract No.: EP-W-06-004
Task Order No.: 0129-RARA-06NK

The EA Project Manager was:

Pat Appel
EA Engineering, Science, and Technology, Inc., PBC
405 S. Highway 121, Building C, Suite 100
Lewisville, TX 75067
972-315-3922

EA used the following subcontractor for the limited ISB RA:

Vista Geoscience
130 Capital Drive, Suite C
Golden, CO 80401
281-310-5560

REFERENCES

EA Engineering, Science, and Technology, Inc., PBC (EA). 2015a. *Remedial Action Work Plan for Jones Road Ground Water Plume Superfund Site, Rev 00, Houston, Harris County, Texas*. August.

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U.S. Environmental Protection Agency (EPA). 2010. Record of Decision, Jones Road Ground Water Plume Superfund Site. Harris County, Texas. September.

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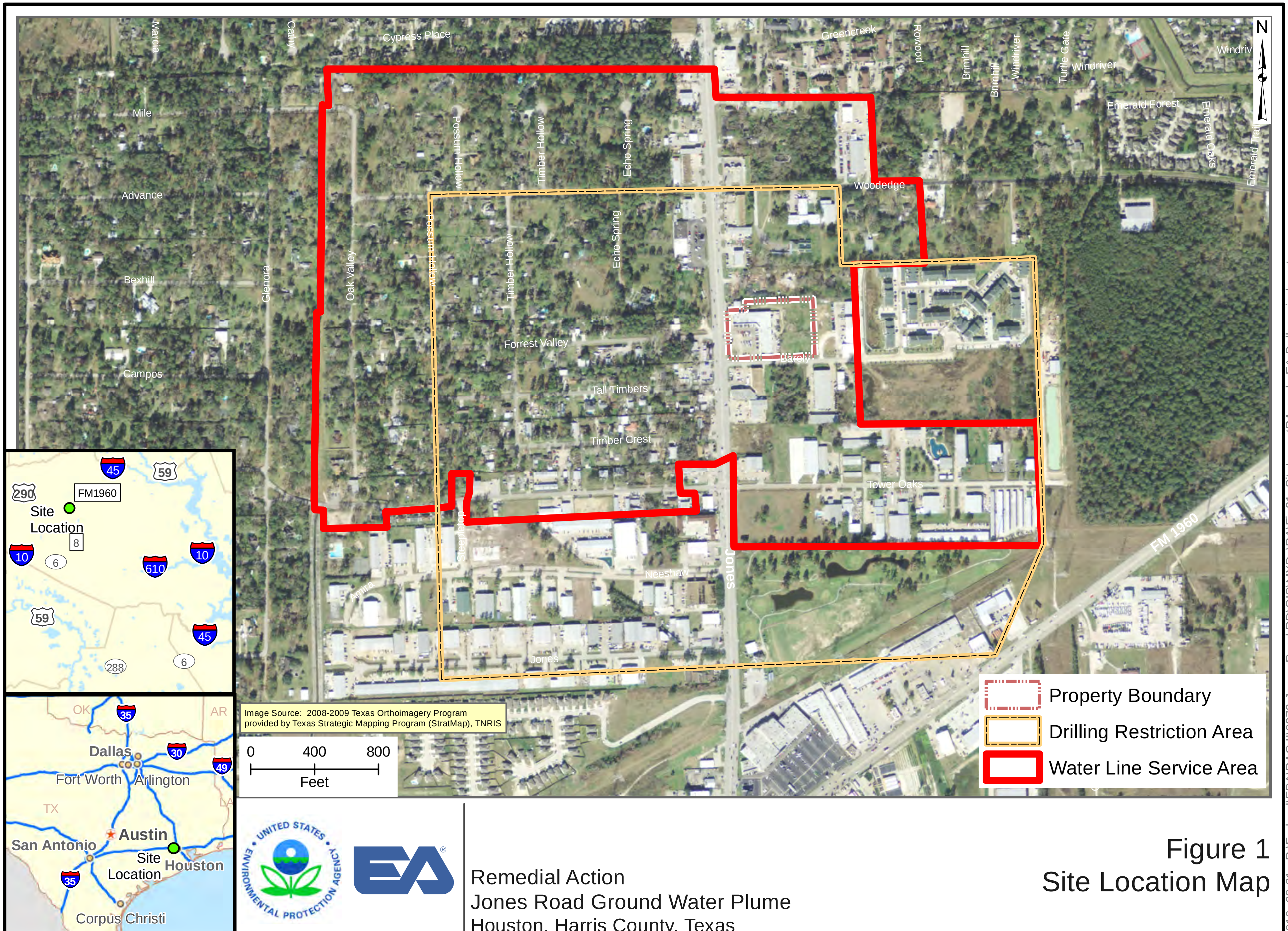
Figures



Remedial Action
Jones Road Ground Water Plume
Houston, Harris County, Texas

Figure 1
Site Location Map

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Image Source: 2008-2009 Texas Orthoimagery Program
provided by Texas Strategic Mapping Program (StratMap), TNRIS

Remedial Action
Jones Road Ground Water Plume
Houston, Harris County, Texas

Figure 2
Well Location Map

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Appendix A

Technical Memorandum on Results of Limited ISB

Technical Memorandum on Results of Limited In Situ Bioremediation
Jones Road Ground Water Plume Superfund Site
Harris County, Texas
EPA Identification No. TXD000605460

Remedial Action Contract 2 Full Service
Contract: EP-W-06-004
Task Order: 0129-RARA-06NK

Prepared for

U.S. Environmental Protection Agency
Region 6
1445 Ross Avenue
Dallas, Texas 75202-2733

Prepared by

EA Engineering, Science, and Technology, Inc.
405 S. Highway 121
Building C, Suite 100
Lewisville, Texas 75067
(972) 315-3922

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ACRONYMS AND ABBREVIATIONS

µg/L	Microgram per liter
bgs	Below ground surface
CLP	Contract Laboratory Program
CVOC	Chlorinated volatile organic compounds
DCE	Dichloroethylene
DO	Dissolved oxygen
EA	EA Engineering, Science, and Technology, Inc., PBC
EPA	U.S. Environmental Protection Agency
ft	Feet (foot)
FM	Farm to Market
ISB	*In situ* bioremediation
MCL	Maximum Contaminant Level
mg/L	Milligram per liter
MNA	Monitored natural attenuation
mV	Millivolt
ORP	Oxygen reduction potential
PCE	Tetrachloroethylene; Perchloroethylene
pH	Log of concentration of hydrogen ions, an index of acidity
psi	Pound per square inch
RA	Remedial Action
RDC	Reductive dechlorination
Site	Jones Road Groundwater Plume Superfund site
SM	Standard Method
SVE	Soil vapor extraction
TCE	Trichloroethylene
TM	Technical memorandum
TOC	Total organic carbon

VC	Vinyl chloride
VOC	Volatile Organic Compound
WBZ	Water-bearing zone

1.0 INTRODUCTION

The U.S. Environmental Protection Agency (EPA), under a Remedial Action Contract, has authorized EA Engineering, Science, and Technology, Inc., PBC (EA) No. EP-W-06-004, Task Order No. 0129-RARA-06NK to implement a focused Remedial Action (RA). The RA includes *in-situ bioremediation* (ISB) of the shallow water-bearing zone (WBZ) at the Jones Road Groundwater Plume Superfund Site (Site) located in the northwest portion of Harris County, Texas.

EA executed the RA at the Site as defined in the September 2010 Record of Decision (EPA 2010) and in accordance with the RA Work Plan dated September 2015 (EA 2015). This technical memorandum (TM) summarizes the results of the sampling events associated with the ISB injections and evaluates the ISB performance. The initial TM was submitted in September 2016 (EA 2016) and this revised TM (Revision 01) incorporates hot spot injection conducted in January 2018 as well as post injection groundwater sampling results.

1.1 SITE DESCRIPTION

The Site is located in northwestern Harris County, Texas (Figure 1). The source of site contamination is the former Bell Dry Cleaners facility, located within the Cypress Shopping Center at 11600 Jones Road, approximately one-half mile north of the intersection of Jones Road and Farm to Market (FM) 1960, outside the city limits of northwest Houston, Texas. The Cypress Shopping Center was constructed in 1984, and the former Bell facility began dry cleaning operations sometime in 1988, using tetrachloroethylene, also known as perchloroethylene (PCE). The former Bell facility continued operating through May 2002 when the dry-cleaning operations were shut down. The hazardous substances present at the Site include PCE, and related daughter products trichloroethylene (TCE), 1,2-dichloroethylene (DCE), and vinyl chloride (VC).

The area around the Site is characterized by residential, commercial, and light industrial development. Residential development has been active since the 1960s, effectively eliminating wildlife habitat from the area. Jones Road is the principal north-south corridor through the area, and FM 1960 (approximately one-half mile to the south) provides a southwest-northeast corridor. Commercial development is dominant along Jones Road with residential and limited commercial development along the side streets. Cypress Creek is located approximately one mile to the northwest of the subject area, and White Oak Bayou is located approximately 3,500 feet (ft) to the south.

1.2 GEOLOGY AND HYDROLOGY

The site is located within the West Gulf Coast Plain, which is part of the Coastal Plain physiographic province. The subsurface geology at the Site consists of Lissie Formation, which is underlain by the Willis Sand, which is underlain by the Goliad Formation and Fleming Formation. The principal water-bearing strata at the Site are the Chicot Aquifer, composed of the Lissie Formation and Willis Sand, and the Evangeline Aquifer comprised of the Goliad Sand and the Upper Fleming Formation. The Chicot Aquifer is above the Evangeline Aquifer.

Water is encountered at two intervals within the Chicot Aquifer beneath the site: the shallow WBZ encountered at around 20 to 30 ft below ground surface (bgs), and the deep WBZ, encountered around 110 ft bgs. A 50-foot interval of dewatered Chicot Aquifer separates the bottom of the Lissie Clay, which perches the shallow WBZ from the deep WBZ.

The shallow WBZ is comprised of a silty sand to sandy silt that is interbedded with sandy clay and clayey sand. The shallow aquifer is underlain by clay that is present from approximately 35 to 60 ft bgs. The groundwater flow within the shallow aquifer is toward the south at a gradient of 0.02 ft per foot.

The deep WBZ is present in a poorly graded, very fine-grained sand that is interbedded with silty and sandy clay and clayey sand. The clay beds are generally less than 10 ft thick, but locally they retard the vertical movement of water. Every sand bed, therefore, has a different hydraulic head (Gabrysch 1984).

1.3 ISB GOALS

The ISB goal is to reduce the site contaminants of concern in the shallow WBZ to the remedial cleanup goals as shown below:

Tetrachloroethene	5 microgram per liter (μg/L)
Trichloroethene	5 μg/L
cis 1,2-Dichloroethylene	70 μg/L
trans 1,2Dichloroethylene	100 μg/L
Vinyl Chloride	2 μg/L

2.0 CHRONOLOGY OF EVENTS

The ISB was conducted in phases: (1) baseline sampling, (2) injection of EHC-L® into the shallow WBZ, (3) post-injection sampling, (4) hot spot injection of EHC-L® into the shallow WBZ, and (5) post hot spot injection sampling.

2.1 BASELINE SAMPLING

Baseline sampling was conducted between 30 November and 3 December 2015.

2.2 INJECTION OF EHC-L®

Initial injection of EHC-L® into the shallow WBZ was conducted over a 7-day period, 26 January 2016 – 1 February 2016. EHC-L®, which is a commercially available product was injected to the shallow groundwater to promote reductive dechlorination (RDC).

2.3 POST-INJECTION SAMPLING

The following post-injection sampling events occurred after the initial full scale ISB injection:

- 19 – 22 April 2016 – Performed post-injection sampling event #1 was conducted and 15 monitoring wells were sampled.
- 20 – 22 September 2016 – Performed post-injection sampling event #2 was conducted and 14 monitoring wells were sampled.
- 21 – 23 February 2017 – Performed post-injection sampling event #3 was conducted and 14 monitoring wells were sampled.
- 11 – 13 September 2017 – Performed post-injection sampling event #4 was conducted and 14 monitoring wells were sampled.

2.4 HOT SPOT INJECTION OF EHC-L®

Hot spot injection of EHC-L® into the shallow WBZ was conducted over a 7-day period, 21 March 2018 – 27 March 2018.

2.5 POST-INJECTION SAMPLING

The following post-injection sampling events occurred after the hot spot ISB injection:

- 14 – 17 May 2018 - Performed post-injection sampling event #6 and 13 monitoring wells were sampled.
- 5 – 7 November 2018 - Performed post-injection sampling event #7 and 13 monitoring wells were sampled.

3.0 OVERVIEW OF REDUCTIVE DECHLORINATION PROCESS

This section describes the chlorinated solvent biodegradation process, including RDC, enhanced monitored natural attenuation (MNA) through biostimulation and bioaugmentation for enhanced MNA.

3.1 REDUCTIVE DECHLORINATION

Biodegradation reactions can occur under a wide range of environmental conditions. The dominant biodegradation mechanism in most groundwater environments for chlorinated contaminants is RDC, which is evidenced by the presence of PCE daughter products: TCE, DCE, and VC.

Chlorinated solvents such as PCE, TCE, and trichloroethane are biodegraded by reductive processes. Naturally occurring, subsurface microorganisms possess the ability to biodegrade chlorinated volatile organic compounds (CVOCs) (e.g., PCE) to non-chlorinated, environmentally acceptable end products (e.g., ethene); carbon dioxide; water; and chloride (Major *et al*:. 1991 and 1995; Edwards and Cox 1997; AFCEE 2004).

RDC occurs under anaerobic conditions and involves the sequential replacement of chlorine atoms on the alkene molecule with hydrogen atoms. Although thermodynamically favorable, most of the reactions involved in chlorinated aliphatic hydrocarbon reduction and oxidation do not proceed abiotically.

Under reducing conditions, PCE serves as an electron acceptor and is dechlorinated to TCE, DCE, VC, and ethene. For this type of reaction to be thermodynamically favorable, the redox potential of the groundwater must be very low (i.e., negative oxidation-reduction potential [ORP]), thereby excluding the presence of dissolved oxygen (DO). PCE is the most susceptible to RDC because it is the most oxidized (i.e., chlorinated). Conversely, VC is the least susceptible to RDC because it is the least oxidized (i.e., chlorinated) of these compounds. As a result, the rate of RDC decreases as the degree of chlorination decreases (Vogel and McCarty 1985; Bouwer 1994).

RDC has been demonstrated under nitrate- and iron-reducing conditions, but the most rapid biodegradation rates, affecting the widest range of chlorinated aliphatic hydrocarbons, occur under sulfate-reducing and methanogenic conditions (Bouwer 1994). Because chlorinated aliphatic hydrocarbon compounds are used as electron acceptors during RDC, there must be an appropriate source of carbon to act as an electron donor for microbial growth in order for this process to occur (Bouwer 1994).

Efficacy of RDC via injection of EHC-L® at the site can typically be evaluated by determining:

- The relative difficulty of distributing EHC-L® into the impacted shallow WBZ of the Chicot Aquifer (i.e., the hydraulic consideration);
- The ability of the EHC-L® to create appropriate anaerobic conditions to facilitate enhanced RDC;

- The ability of the EHC-L® to degrade PCE, TCE, and DCE through VC to the end products, ethene or ethane;

- The rate at which degradation occurs; and

- The amount of deleterious byproducts (e.g., VC accumulation and increased metals concentrations) generated.

3.2 ENHANCED ATTENUATION THROUGH BIOSTIMULATION

An adequate supply of electron donors is required to promote the complete RDC of chloroethenes. Potential carbon sources include natural organic matter, fuel hydrocarbons, or other anthropogenic organic compounds. At sites where the existing supply of electron donors in groundwater is scarce, a remedy can be designed to deliver electron donors to the subsurface (a process referred to as biostimulation). Simple organic carbon compounds such as alcohols (e.g., methanol, ethanol); organic acids (provided by lactate and acetate); sugars (provided by molasses); or edible oils (e.g., soybean, canola, or olive oil) can serve as electron donors for the dechlorination reaction.

Soluble electron donors such as organic acids and alcohols are often employed in remedial systems, for sites of moderate-to-high hydraulic conductivity, where rapid treatment is required. Low-solubility electron donors, such as emulsified soybean oil and oleate, are often used at sites where hydraulic conductivity is low and/or slower treatment is acceptable. The selection of an appropriate electron donor for a given site is a function of a variety of site-specific conditions, including hydraulic conductivity of the impacted formation, objectives for cleanup timeframe, contaminant and groundwater chemistry, potential for secondary impacts to drinking water quality, and cost.

Electron donor consumption is dependent on the target CVOC concentration and the groundwater geochemistry (i.e., presence of naturally occurring electron acceptors such as oxygen, nitrate, and sulfate that will consume the donor). For sites that initially have aerobic conditions, the addition of an electron donor will first stimulate the growth of native aerobic bacteria, which consumes available oxygen. As subsurface conditions become increasingly anoxic and reducing, the aerobic microbial populations decline while anaerobic microbial populations increase and begin to actively utilize available electron acceptors (i.e., nitrate, sulfate, ferric iron, manganese, and organic carbon) in order of greatest to least energy yield.

An ORP of less than -100 millivolts (mV) and a DO concentration less than 0.5 milligrams per liter (mg/L), in combination with a decline in nitrate and sulfate concentrations, are indications that suitable subsurface conditions exist for RDC. The mass of amendment required for biostimulation is determined using the stoichiometric demand exerted by the known quantities of electron acceptors, either naturally occurring or in contaminants. The quantity of electron acceptors is calculated in electron equivalents, and then a safety factor is applied to quantify the amount of electron donor to be added during the biostimulation period.

4.0 ISB FIELD ACTIVITIES

The ISB activities included baseline sampling, initial full-scale injection of the amendment, hot spot injection, and several post-injection sampling events following the individual injection events. EHC-L® is a cold-water soluble, food-grade formulation with a base composition of controlled-release organic carbon lecithin and an organo-iron compound that is specially designed for injection. It is applied through wells or hydraulic injection networks for the treatment of a wide range of groundwater contaminants. Manufacturer's information regarding EHC-L® is provided in Attachment A. Specifics regarding the ISB and field activities follows.

4.1 BASELINE SAMPLING

Prior to injecting EHC-L®, pre-injection sampling was conducted at 14 monitoring wells from 30 November 2015 – 3 December 2015. Each monitoring well was gauged using an oil/water interface probe prior to purging to document the depth of groundwater from top of the well casing. The depth to water values are shown in Table 1. Field parameters including DO, pH, ORP, temperature, conductivity, and turbidity were measured in the field. The field geochemistry results are shown in Table 2. Pre-injection groundwater samples were collected using the low-flow sampling technique.

Samples were analyzed for dissolved metals by Contract Laboratory Program (CLP) ILMO5.3, volatile organic compounds (VOCs) by CLP OLM04.2, total organic carbon (TOC) by Standard Method (SM) 5310D-2000, dissolved gases by EPA Method RSK-175, ammonia by EPA Method 350.1, orthophosphate by SM4500 PE-1999, and nitrate-nitrite nitrogen by EPA Method 353.2.

Groundwater samples were submitted to EPA Region 6 Laboratory for analysis of dissolved metals and VOCs. Groundwater samples were submitted to the Test America Laboratories, Inc. located in Houston, Texas for analysis of TOC, dissolved gasses, ammonia, orthophosphate, and nitrate-nitrite nitrogen. The pre-injection sampling results are provided in Tables 3 through 5 and shown on Figures 2 through 13. Analytical laboratory reports are included in Attachment B. Sampling field forms are included in Attachment C.

4.2 INJECTION PROCESS

ISB was conducted in the shallow WBZ using EHC-L®. EHC-L® was applied through direct-push technology.

On 22 January 2016, Vista GeoScience mobilized to the Site to begin pre-injection activities. EHC-L® injections occurred 25 January – 1 February 2016. Site cleanup and demobilization occurred 2 February 2016.

Each batch mixture of EHC-L® and water was mixed on-site by Vista Geoscience per manufacturer instructions (Attachment A). The Vista GeoScience injection report describes the preparation of the injection solutions (Attachment D).

The injection locations were separated into two different areas, A and B, as shown on Figure 14. Injection at area A targeted at the source area, and the concentration of the amendment mixture was higher than that in area B (approximately double in concentration). Amendment mixture was injected using direct-push technology via a 1.5-inch custom retractable injection tool and injections were monitored using digital flow and pressure gauges. Each location was started individually and with increased pressure in five pounds per square inch (psi) increments. Injection logs in the Vista GeoScience injection report (Attachment D) include individual flows, volumes and notes. A total of 6,489 gallons of EHC-L®, 3,344 pounds of EHC-L Dry Mix, 4,798 pounds of potassium bicarbonate, 108 liters of the inoculum, dehalococcoides (DHC), and 40,948 gallons of water was injection into 63 locations.

During the injection, field data was collected by Vista GeoScience and EA. Vista GeoScience completed the injection logs and are included in Attachment D. EA kept field notes regarding the injection process and events and are included in Attachment E. Photographic documentation is included in Attachment F. State of Texas injection well reports are included in Attachment G.

4.3 POST-INJECTION SAMPLING

Following the initial ISB injection the following four post-injection sampling events were conducted:

- 19 – 22 April 2016 – Performed post-injection sampling event #1 and 15 monitor wells were sampled.
- 20 – 22 September 2016 – Performed post-injection sampling event #2 and 14 monitoring wells were sampled.
- 21 – 23 February 2017 – Performed post-injection sampling event #3 and 14 monitoring wells were sampled.
- 11 – 13 September 2017 – Performed post-injection sampling event #4 and 14 monitoring wells were sampled.

During each sampling event each monitoring well was gauged using an oil/water interface probe prior to purging to document the depth of groundwater from the top of the well casing. The depth to water values are shown in Table 1. DO, pH, ORP, temperature, conductivity, and turbidity were measured in the field. The field geochemistry results are shown in Table 2. Pre-injection groundwater samples were collected using the low-flow sampling technique, however, in

instances where the water level was too low for low-flow sampling or recharge was slow to occur a bailer was used to collect a sample.
Samples were analyzed for dissolved metals by EPA Method 6020A, mercury by EPA Method 7470A, VOCs by EPA Method 8260B, TOC by SM 5310D-2000, dissolved gases by EPA Method RSK-175, ammonia by EPA Method 350.1, orthophosphate by SM4500 PE-1999, and nitrate-nitrite nitrogen by EPA Method 353.2.

Groundwater samples were submitted to the Test America Laboratories, Inc. located in Pittsburgh, PA for analysis of dissolved metals and mercury. Groundwater samples were submitted to the Test America Laboratories, Inc. located in Houston, Texas for analysis of VOCs, TOC, dissolved gasses, ammonia, orthophosphate, and nitrate-nitrite nitrogen. The post-injection sampling results are provided in Tables 3 through 5 and presented on Figures 2 through 13. Analytical laboratory reports are included in Attachment B. Sampling field forms are included in Attachment C.

4.4 HOT SPOT INJECTION PROCESS

Results from post injection sampling showed that RDC was beginning to decline in the south of the source area, most specifically MW-20 and MW-22 as summarized in the following:

Well MW-20

- The baseline concentration of PCE in MW-20 decreased over 97 percent a year after the ISB injection. However, as shown on Figure 23, by September 2017 PCE began trending upward.

- TCE concentrations in MW-20 decreased by 96 percent over the first year after ISB, by September of 2017, TCE concentration flatten out (Figure 24).

- The concentration of cis 1,2-DCE slightly increased after the ISB injection, by February 2017, the concentration decreased by 93 percent by February 2017 and started to flatten out by September 2017 (Figure 25).

- The concentration of VC peaked after the ISB injection, decline in February 2017 and flatten out by September 2017 (Figure 27).

- During the baseline sampling event, ethene and ethane were not detected in well MW-20 (Figure 28). Ethene concentrations increased post-injection, with the highest concentrations observed during September 2016 sampling events. Ethane levels increased slightly after the injection, peaking in February 2017.

- After the ISB injection, methane concentrations increased substantially in MW-22, indicating increased methanogenesis but by September 2017 methane concentrations began trending downward (Figures 21 and 34).

Well MW-22

- TCE concentrations in MW-22 decreased almost by 100 percent the first year after ISB, by September 2017 PCE began trending upward (Figure 24).

- The concentration of cis 1,2-DCE slightly increased after the ISB injection, by February 2017, the concentration decreased by 94 percent by February 2017 and started to flatten out by September 2017, which may indicate DCE stall (Figure 25).

- The concentration of VC peaked after the ISB injection, declined in February 2017 and flatten out by September 2017 (Figure 27).

- During the baseline sampling event, ethene and ethane were not detected in well MW-20. Ethene concentrations increased post-injection, with the highest concentrations observed during September 2016 sampling event and began trending downward by February 2017 (Figure 28).

The sample results indicated that RDC had slowed down approximately 19 months after the initial full-scale injection at wells MW-20 and MW-22, and the concentrations of PCE and TCE in these two wells remained elevated and daughter products, DCE and VC appeared to be stall. Therefore, a hot spot injection in this area was proposed.

On 21 March 2018, Vista GeoScience mobilized to the Site to begin pre-injection activities. On 26 March 2018, the site was set up and injections were ready to commence, however, there were delivery issued with the hydrant meter, which cause activities to be delay for a day. Injection was initiated on 27 March 2018.

Each batch mixture of EHC-L® and water was mixed on-site by Vista Geoscience per manufacturer instructions (Attachment A). The Vista GeoScience injection report describes the preparation of the injection solutions (Attachment D).

The hot spot injection was conducted in the same approach as in the initial full scale injection. The target injection interval was four feet approximately from 28 feet bgs to 32 feet bgs. The injection locations are shown on Figure 14, there were a total of ten locations. Amendment mixture was injected via a custom injection manifold, which allowed to injection up to four locations at a time. Each location varied in its flow rates and injection pressures, with the intention of keeping injection pressure below 60 - 70 psi to allow the product to flow into the formation without displacing the water table. Each location was started individually and with increased pressure in five psi increments. Injection logs in the Vista GeoScience injection report

(Attachment D) include individual flows, volumes and notes. A total of 825 gallons of EHC-L®, 375 pounds of EHC-L Dry Mix, 550 pounds of potassium bicarbonate, and 3,600 gallons of water was inject into 10 locations.

During the injection, field data was collected by Vista GeoScience and EA. Vista GeoScience completed the injection logs which are included in Attachment D. Field notes regarding the injection process are included in Attachment E. Photographic documentation is included in Attachment F. State of Texas injection well reports are included in Attachment G.

4.5 POST HOT SPOT INJECTION SAMPLING

Two post-injection sampling were conducted after the hot spot injection; event number 5 (which is the first sampling event after the hot spot injection and the fifth event since the initial full scale injection) was performed between 14 and 27 May 2018 and 13 monitoring wells were sampled, and event number 6 was performed between 5 and 7 November 2018 and 14 monitoring wells were sampled. During each event monitoring wells were gauged using an oil/water interface probe prior to purging to document the depth of groundwater from the top of the well casing. The depth to water values are shown in Table 1. DO, pH, ORP, temperature, conductivity, and turbidity were measured in the field. The field geochemistry results are shown in Table 2. Pre-injection groundwater samples were collected using the low-flow sampling technique, however, in instances where the water level was too low for low-flow sampling or recharge was slow to occur a bailer was used to collect a sample.

Samples were analyzed for dissolved metals by EPA Method 6020A, mercury by EPA Method 7470A, VOCs by EPA Method 8260B, TOC by SM 5310D-2000, dissolved gases by EPA Method RSK-175, ammonia by EPA Method 350.1, orthophosphate by SM4500 PE-1999, and nitrate-nitrite nitrogen by EPA Method 353.2.

Groundwater samples were submitted to the Test America Laboratories, Inc. located in Pittsburgh, PA for analysis of dissolved metals and mercury. Groundwater samples were submitted to the Test America Laboratories, Inc. located in Houston, Texas for analysis of VOCs, TOC, dissolved gasses, ammonia, orthophosphate, and nitrate-nitrite nitrogen. The post-injection sampling results are provided in Tables 3 through 5 and presented on Figures 2 through 13. Analytical laboratory reports are included in Attachment B. Sampling field forms are included in Attachment C.

5.0 ISB RESULTS

5.1 INJECTION PRESSURE AND FLOW RATE

The injection rate ranged from <1-10 gallons per minute of EHC-L® mixture at 45 – 160 psi gauge pressure on the injection line. Injection mechanics are summarized in Table 6A and Table 6B.

5.2 CONCENTRATIONS OF CVOCS

Analytical results of CVOCs are presented in Table 5 and Figures 2, 3, 4, 5, and 6 for PCE, TCE, cis DCE, trans DCE, and VC, respectively.

5.3 *IN SITU* BIOREMEDIATION INDICATORS

ISB indicators including field parameter measurements and laboratory analytical data were used to determine if subsurface conditions were favorable for RDC. The field parameter measurements, including ORP, DO and pH, are summarized in Table 2, and ORP, DO, and pH trends are shown in Figures 15 through 17, respectively. Analytical results for MNA parameters are summarized in Table 4.

Analytical results for dissolved metals are summarized in Table 3 and shown on Figures 11 through 13. Initial dissolved metal trends are shown in Figures 18 through 20. Methane and TOC results are shown on Figures 9 and 10, respectively. Methane and TOC trends are shown in Figures 21 and 22, respectively. Analytical results for chlorinated ethenes are summarized in Table 5 and shown on Figures 2 through 8. Chlorinated ethene trends are shown in Figures 23 through 29 and molar concentrations of chlorinated ethenes for wells with detections are presented in Figures 30 through 35.

6.0 PERFORMANCE EVALUATION

This section evaluates performance of EHC-L® in the shallow WBZ based on the results of groundwater sample results. Both the ISB initial full-scale injection and hot spot injection were intended to promote a groundwater condition favorable for RDC. Groundwater reducing condition was assessed based on the geochemical analysis, i.e., ORP, dissolved metal concentrations, and DO. Evidence of dechlorination, i.e., concentration changes in PCE, TCE, cis DCE, and VC, and production of ethene, ethane and methane as RDC end products were also evaluated and presented in this section.

6.1 ISB INJECTION PERFORMANCE EVALUATION

In order to evaluate the progress of enhanced RDC at the Site, results of baseline samples and post injection samples were compared. Analytical results are presented in Tables 2 through 5 and shown in Figures 2 through 35. A summary of the results is discussed in the following sections.

6.1.1 Geochemical Field Parameter Trends

The favorability for RDC based on the pH, DO, ORP, methane, nitrates, and TOC is presented in Table 7.

Total Organic Carbon

As indicated in the technical guidance, In Situ Bioremediation of Chlorinated Ethene (ITRC 2008), TOC concentrations above 20 mg/L are considered favorable for RDC. Thus, in this report, TOC concentrations below 20 mg/L were considered low, between 20 mg/L and 200 mg/L moderate, and above 200 mg/L high. TOC concentrations are presented in Table 4 and Figure 10, and TOC concentration trends are presented in Figure 22.

The baseline sampling event in December 2015 showed all sampled wells but MW-08 to have TOC concentration below the favorable range for RDC with concentrations under 20 mg/L. MW-08, which is located outside of the treatment areas had a moderately favorable TOC concentration of 35.8 mg/L.

After the ISB injection, on the first sampling event all of the wells that are located in the treatment areas (MW-01, MW-02, MW-06, MW-20, and MW-22) showed favorable TOC concentration, except MW-20 and MW-22. TOC concentration in MW-01, MW-02, and MW-06 decreased over time but remained elevated for approximately six months before dropped to below the favorable level. Effect of the 2016 injection on TOC in MW-20 appeared delayed and TOC concentration increased approximately seven months after the injection; while TOC significantly increased in May 2018 after the hot spot injection near this well. Both injection events did not significantly raise the TOC level in MW-22 to a favorable level. Overall, as of the last sampling event, November 2018, all wells showed TOC concentrations below the favorable range for RDC.

ORP

ORP values below -50 mV were considered slightly reducing and indicative of conditions where RDC may occur (ITRC 2008). ORP values below -100 mV were considered reductive and indicative of conditions where RDC is likely to occur.

ORP measurements of less than -50 mV (within the range at which RDC may occur) were observed in several wells pre-injection process and post injection process, with some exceptions. After the hot spot injection process, ORP measurement were favorable in all wells. ORP concentrations are presented in Table 2 and ORP concentration trends are presented in Figure 15.

Dissolved oxygen

Pre-injection, no DO measurements were below 0.5 mg/L, which is considered favorable to RDC (ITRC 2008). After injection, DO in the injection areas fluctuated but remained relatively low and favorable to RDC. DO concentrations are presented in Table 2 and DO concentration trends are presented in Figure 16.

pH

The pH measurements observer pre-injection, post injection and post hot spot injection were within the acceptable range of 5 to 9. The pH results are presented in Table 2 and pH trends are presented in Figure 17.

6.1.2 Reduction of PCE Concentrations

The concentrations of PCE before the ISB injection ranged from 5,550 micrograms per liter (µg/L) in the downgradient area (MW-20) to 14,500 µg/L in the source area (MW-01). After the ISB injection in 2016, PCE concentrations decreased and had remained below the ISB goal, the maximum concentration level (MCL) of 5 µg/L in the wells within the treatment areas with the exception of MW-02, MW-20, and MW-22. PCE concentration in MW-02 reduced to below the MCL after the 2016 injection but rebounded close to the pre-injection level in November 2018 (2 years and 10 months after the injection) (Table 5 and Figure 23).

PCE concentration in MW-20 decreased approximately 97 percent one year after the initial full-scale injection, but it remained elevated and increased to 228 µg/L in September 2017 (Table 5, and Figure 23). Thus, a hot spot injection was conducted in the area in March 2018, which significantly reduced the PCE concentration in MW-20 to 7 µg/L in May 2018. However, the PCE slightly increase to 21 µg/L in November 2018 at this well. Similar rebound was observed in MW-22, at which PCE concentration was non-detect from September 2016 to May 2018, and rebounded to 11 µg/L in November 2018. PCE concentrations are presented in Table 5 and Figures 2, 23 and 30 - 35.

Overall RDC by injection of EHC-L® was highly effective to reduce PCE concentration at the site.

6.1.3 Formation of Daughter Products

Formation and subsequent dechlorination of PCE daughter products provide additional evidence of RDC occurring at the site.

Concentrations of TCE before the initial injection ranged from 957 µg/L in the downgradient well (MW-22) to 1,990 µg/L in the source area (MW-01). After the ISB injection in 2016, TCE concentrations decreased to below the MCL of 5 µg/L in the source area (MW-01 and MW-02) and had been below the MCL until November 2018 (2 years and 10 months after the initial injection), when TCE rebounded considerably at MW-02 (Table 5). In the downgradient well MW-20, TCE concentration decreased approximately 96 percent one year after the initial full-scale injection, but it stalled at a level of 60 µg/L in 2017 (Table 5). The hot spot injection in March 2018, however reduced the TCE concentration at MW-20 to 8.9 µg/L based on the May 2018 sample results. The hot spot injection did not provide sustaining reduction and TCE concentration in MW-20 rebounded to 71.3 µg/L 8 months after hot spot injection.

During RDC, all three isomers of DCE (cis 1,2-DCE, trans 1,2-DCE and 1,1-DCE) can be produced; however, cis 1,2-DCE is the more commonly produced isomer (EPA 1998). After the initial full scale injection, the concentration of cis 1,2-DCE increased around the source area at well MW-01 and then reduced more than 99 percent by September 2016, after which the concentration of cis 1,2-DCE gradually increased to 1,230 µg/L in November 2018 at MW-01. The concentration of cis 1,2-DCE at the other source well, MW-02 however fluctuated and went back to the pre-injection level in November 2018 (Table 5 and Figure 25). Increase in cis 1,2-DCE in the source area can be partially resulted from dechlorination of its parent compounds, PCE and TCE.

On the other hand, concentrations of cis 1,2-DCE slightly increased after the initial full-scale injection and began to trend downward at downgradient wells, MW-20 and MW-22. After the hot spot injection these concentrations continued to decrease. Thus, the hot spot injection appears to be effective to reduce the DCE concentration. cis 1,2-DCE and trans 1,2-DCE concentrations are presented in Table 5 and Figures 4-5, 25-26 and 30-35.

Concentration of VC at source well MW-01 changed in a similar fashion as cis 1,2-DCE and it reduced more than 99 percent by February 2017 and rebounded back to the pre-injection level in November 2018. The other source well, MW-02 also behaved similarly in VC concentration to cis 1,2-DCE concentration and VC concentration had accumulated to a level in November 2018 much higher than the pre-injection level. In downgradient wells, MW-20 and MW-22 however, VC concentration increased after the initial injection and stalled and decreased due to the hot spot injection (Figure 27). VC concentrations are presented in Table 5 and Figures 6, 27, and 30-35.

The presence of ethene, and ethane indicates the RDC process reached completion. In all wells at the treated areas (MW-01, MW-02, MW-06, MW-20 and MW22) accumulation of ethene, ethane, and methane was observed as showed in Figure 28, Figure 29, and Figure 21, respectively.

6.1.4 Formation of Deleterious Byproducts

Arsenic, iron, and manganese may become dissolved under reducing condition resulting from the injection. After the first and the hot spot injections, dissolved concentrations of iron, manganese and arsenic each increased in the wells in the treated areas.

Iron and manganese concentrations increased in wells, MW-01, MW-02, MW-06, MW-20, MW-21 and MW-22, above the MCLs of 300 µg/L and 50 µg/L, respectively. By November 2018, the iron and manganese concentrations still remained elevated and higher than the pre-injection levels (Table 3, and Figure 19 for dissolved iron and Figure 20 for dissolved manganese concentrations).

The pre-injection dissolved arsenic concentrations were below the MCL in all monitoring wells other than MW-01 and MW-04. After both injections, the concentrations of dissolved arsenic increased in the wells in the treated areas and remained above the MCL of 10 μg/L in November 2018 (Table 3 and Figure 18).

7.0 SUMMARY AND CONCLUSIONS

Based on the sample results collected before and after ISB injections, conclusions are summarized in this section.

- The ISB injection effectively reduced PCE concentrations in the source area to a 99 percent reduction and remained effective in the source area for approximately two years and ten months before rebound took place (Figure 23). MW-02 PCE concentration rebounded to the pre-injection level and the significant rebound in this well may be due to the lower dosing than that in MW-01.

- The ISB injections also effectively reduced PCE concentration in the downgradient area to a 97 percent reduction (i.e. MW-20). The reduction of PCE was not as effective as that in the source area because of lower dosing of the reagents in the downgradient area. The hot spot injection in the downgradient area however, reduced the PCE concentration further. Rebound also took place in November 2018 as in the source area (Figure 23).

- As of November 2018, MW-02, MW-20, and MW-22 PCE concentration was above the MCL of 5 μg/L.

- TCE concentration reduction in the treated areas appear very similar to the PCE concentration reduction. TCE rebound also took place two years and ten months after the initial injection in 2016. MW-20 TCE remained elevated even after the hot spot injection. As of November 2018, only MW-02 and MW-20 TCE concentration was above the MCL of 5 μg/L.

- Daughter products, cis 1,2-DCE and VC were generated considerably in the source area (MW-01 and MW-02) and remained elevated in the last sampling event, November 2018. cis 1,2-DCE and VC concentrations were at or above the pre-injection level in MW-02 and reduced approximately 81 percent and 26 percent, respectively in MW-01 by November 2018.

- cis 1,2-DCE and VC concentrations in the downgradient area (MW-20 and MW-22) in general stalled and remained elevated. The hot spot injection which only treated downgradient area, reduced the concentrations of cis 1,2-DCE and VC in the area significantly. Overall, downgradient wells DCE concentration reduced approximately 96-99 percent, and VC concentration reduced approximately 63-91 percent.

- As of November 2018, cis 1,2-DCE concentration was still above the MCL of 70 µg/L in MW-01, MW-02, and MW-20; and VC concentration above the MCL of 2 µg/L in all wells within the treated areas (MW-01, MW-02, MW-06, MW-20, and MW-22).

- ISB injections promoted reducing condition in the treated area, therefore dissolved metals, iron, manganese, and arsenic concentrations increased and remained elevated above pre-injection level.

- Significant amounts of ethane, ethene and methane were generated, which are the end products from the enhanced biodegradation and reduction of the chlorinated compounds by the ISB injections.

It should note that installation of a soil vapor extraction (SVE) system is ongoing during the preparation of this report. The SVE is designed to remediate the shallow soils in the source area and will be operated through November 2020. Future injection of any reagents in the source area may interfere the SVE operations, therefore additional ISB injection is not recommended during SVE operations.

In addition, because of the shallow depth of the groundwater at the site, SVE operations may likely extract groundwater from the shallow WBZ, impacting concentrations of the chlorinated compounds. Therefore, additional sampling should be conducted after SVE completes its operation to evaluate the groundwater condition before any additional ISB injection.

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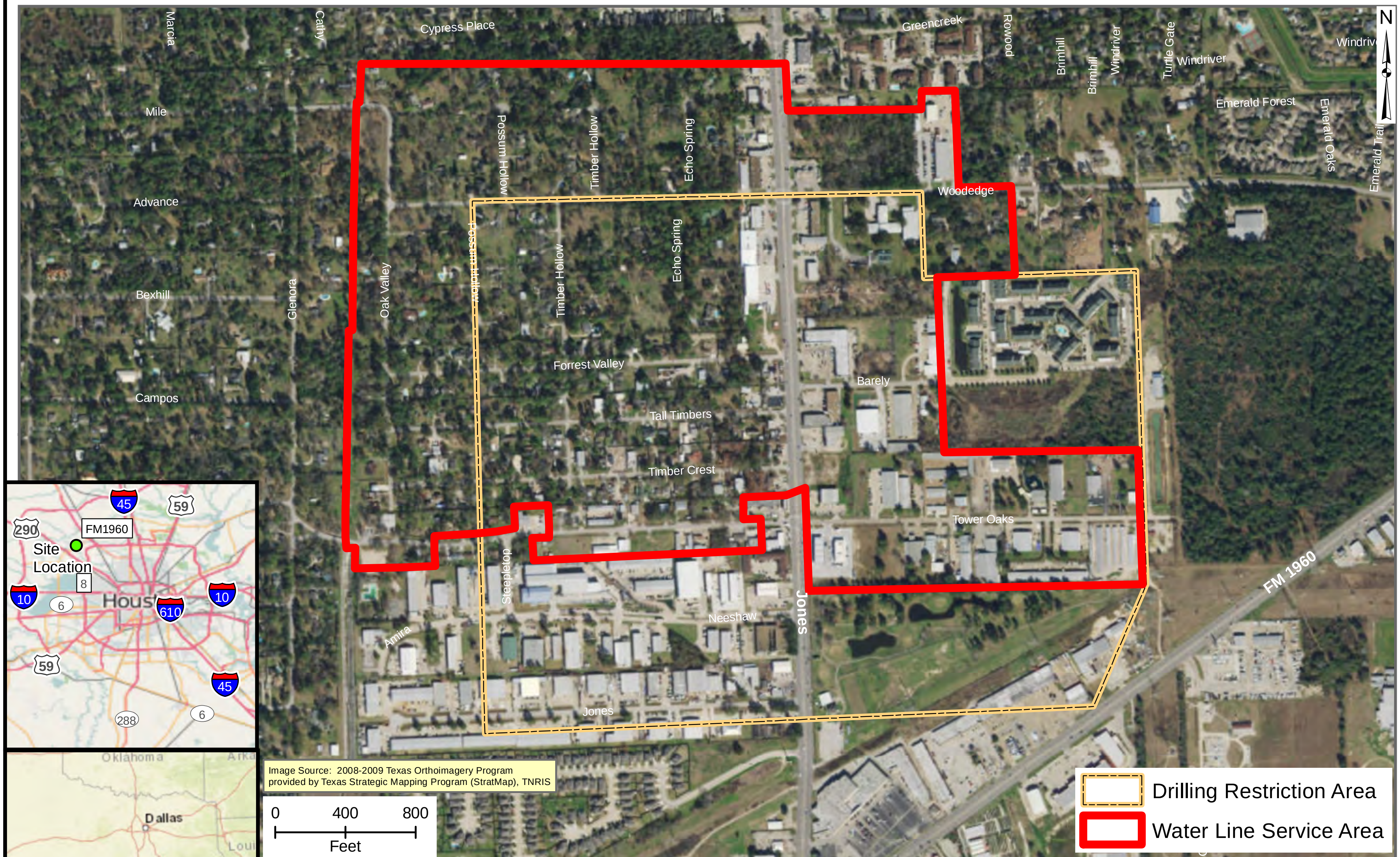
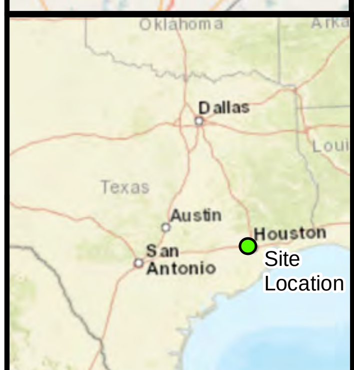
FIGURES





Remedial Action
Jones Road Ground Water Plume
Houston, Harris County, Texas

Figure 1
Site Location Map

2011-12-08 r:\federal\epa\rac ii\0070-jones road rd\gis\mxds\fig01_sitelayoutra.mxd EA-Dallas jschwertz

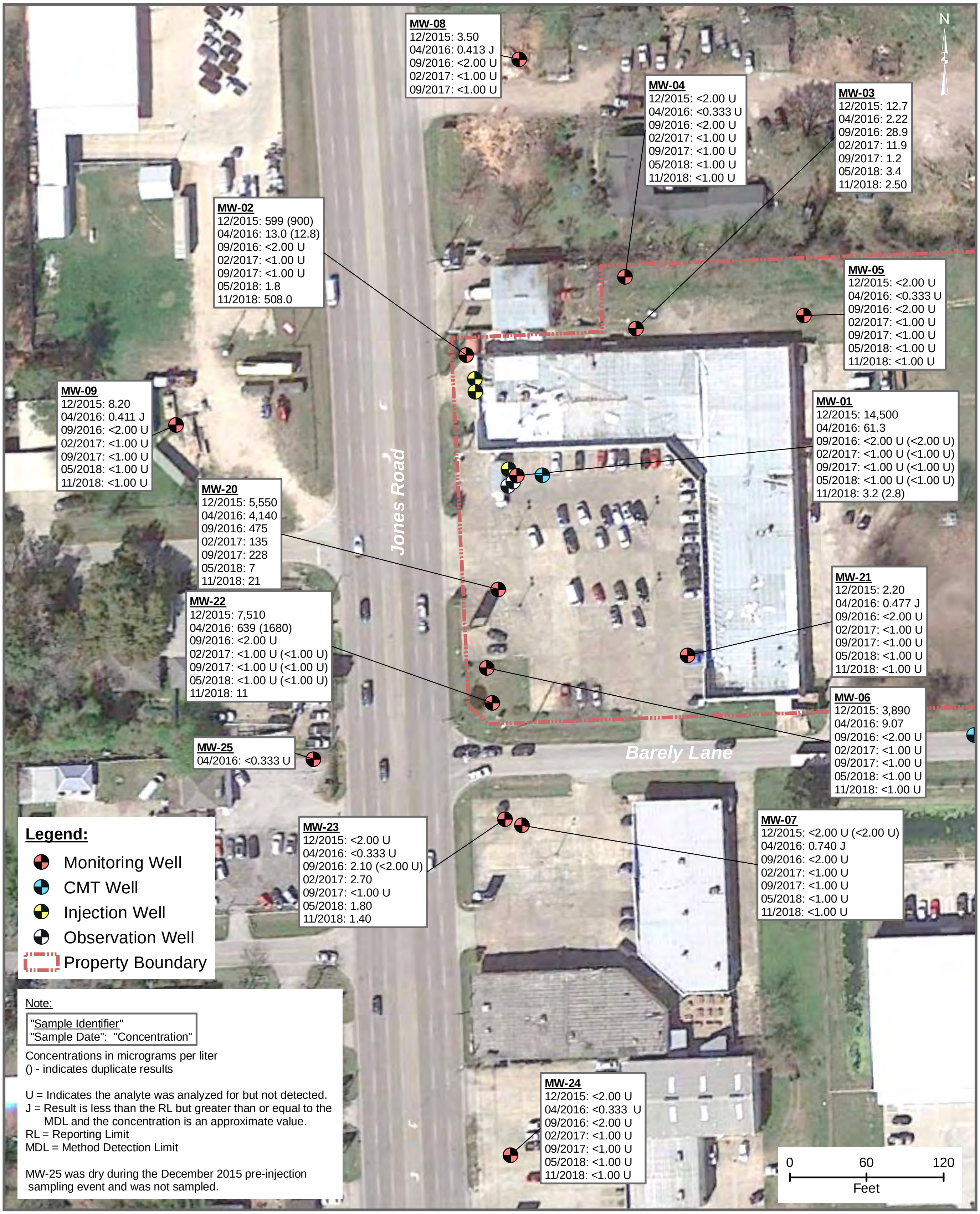


Image Source: GoogleEarth Pro, 2016

Remedial Action
Jones Road Ground Water Plume
Houston, Harris County, Texas

Figure 2
Tetrachloroethene Results

2019-03-14 R:\Federal\EPA\RAC II\0070-Jones Road RD\GIS\MXDs\201902\JonesPCE201902ifs_new.mxd EA-Dallas jschwertz

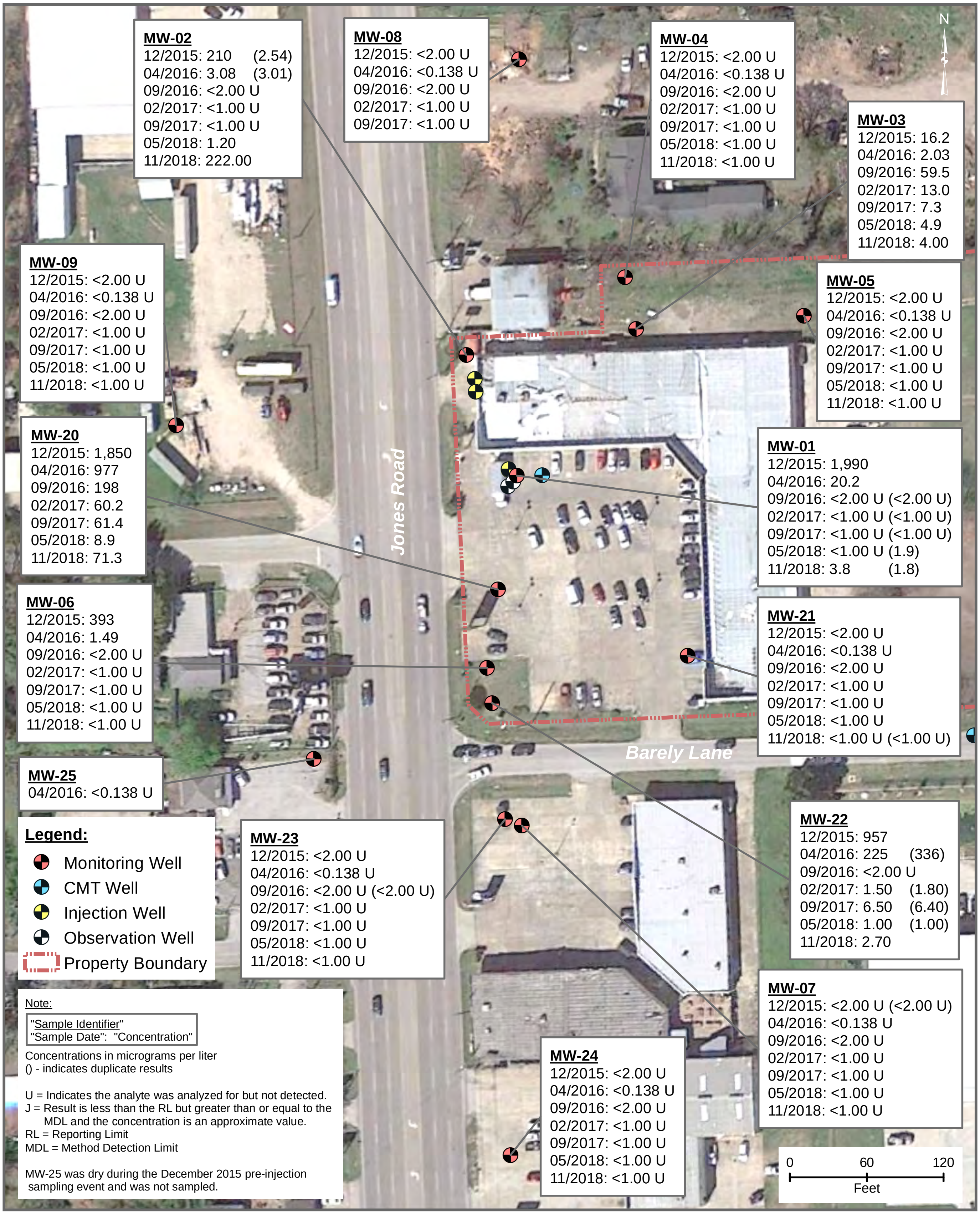


Image Source: GoogleEarth Pro, 2016

Remedial Action
Jones Road Ground Water Plume
Houston, Harris County, Texas

Figure 3
Trichloroethene Results

2019 -03-06 R:\Federal\EPA\RAC II\0070-Jones Road RD\GIS\MXDs\201902\JonesPCE201902.mxd EA-Dallas rdolezal

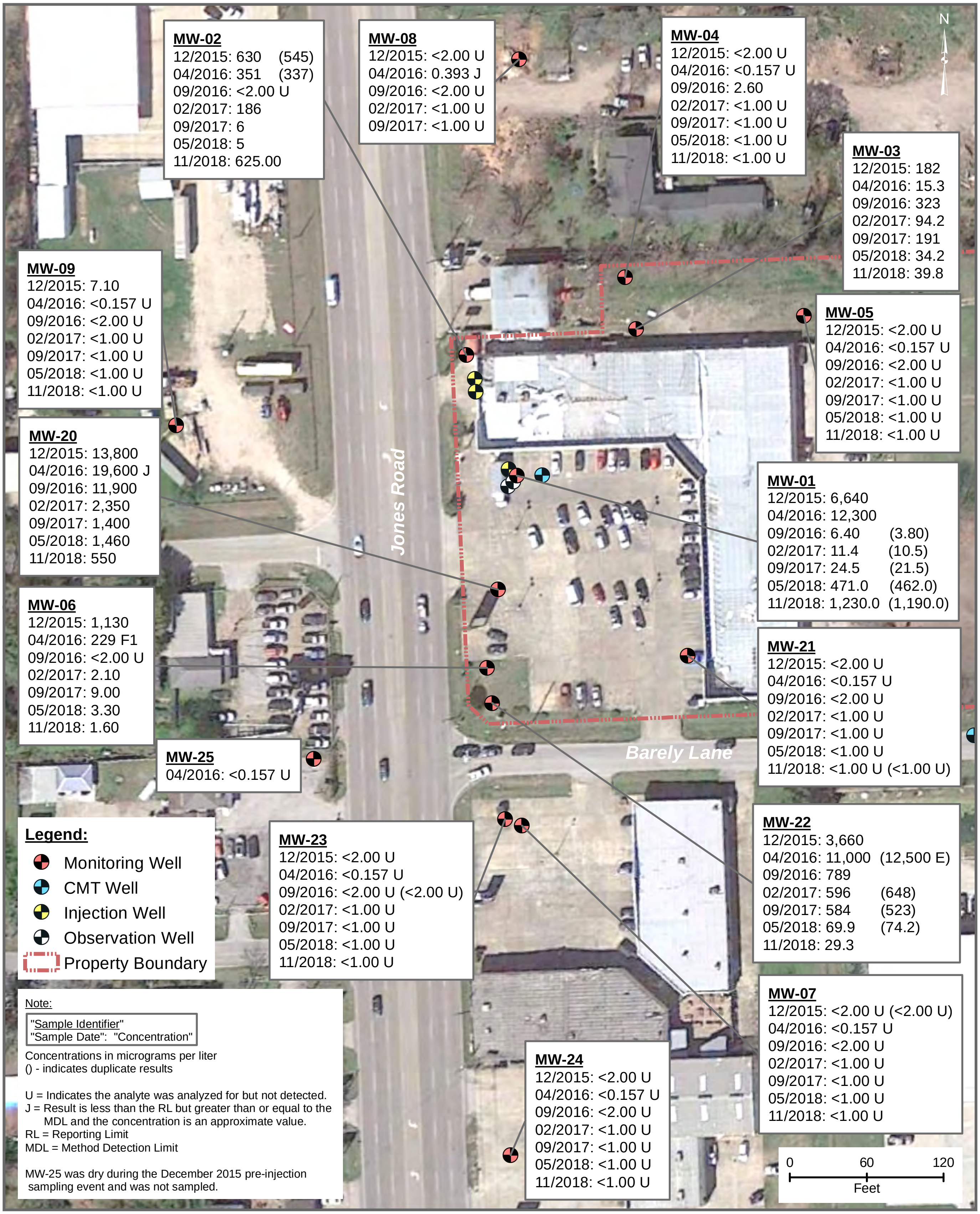


Image Source: GoogleEarth Pro, 2016

Remedial Action
Jones Road Ground Water Plume
Houston, Harris County, Texas

Figure 4
cis-1,2-Dichloroethene Results

2019 -03-06 R:\Federal\EPA\RAC II\0070-Jones Road RD\GIS\MXDs\201902\JonesPCE201902.mxd EA-Dallas rdolezal

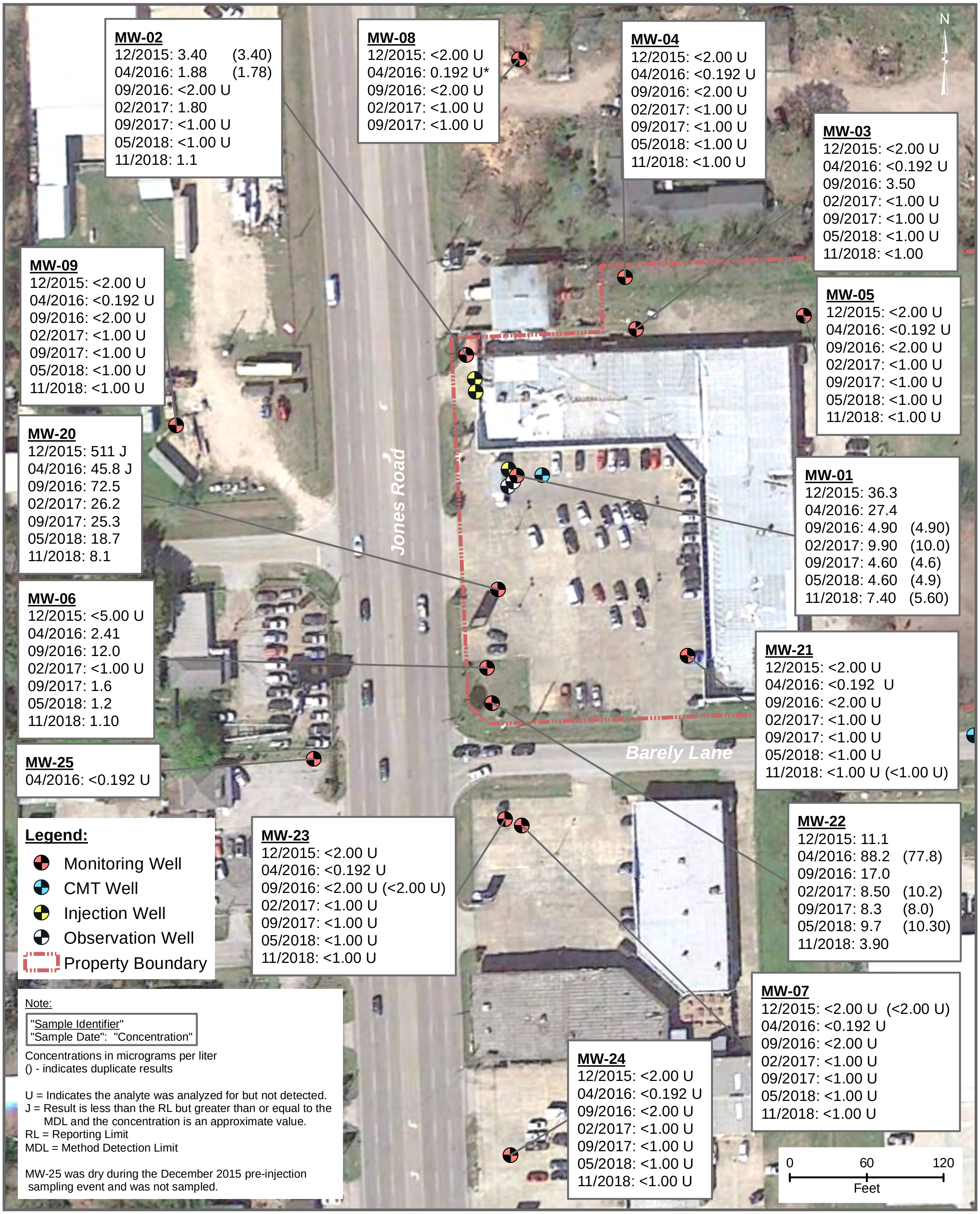


Image Source: GoogleEarth Pro, 2016

Figure 5
trans-1,2-Dichloroethene Results

Remedial Action
Jones Road Ground Water Plume
Houston, Harris County, Texas

2019 -03-06 R:\Federal\EPA\RAC II\0070-Jones Road RD\GIS\MXDs\201902\JonesPCE201902.mxd EA-Dallas rdolezal

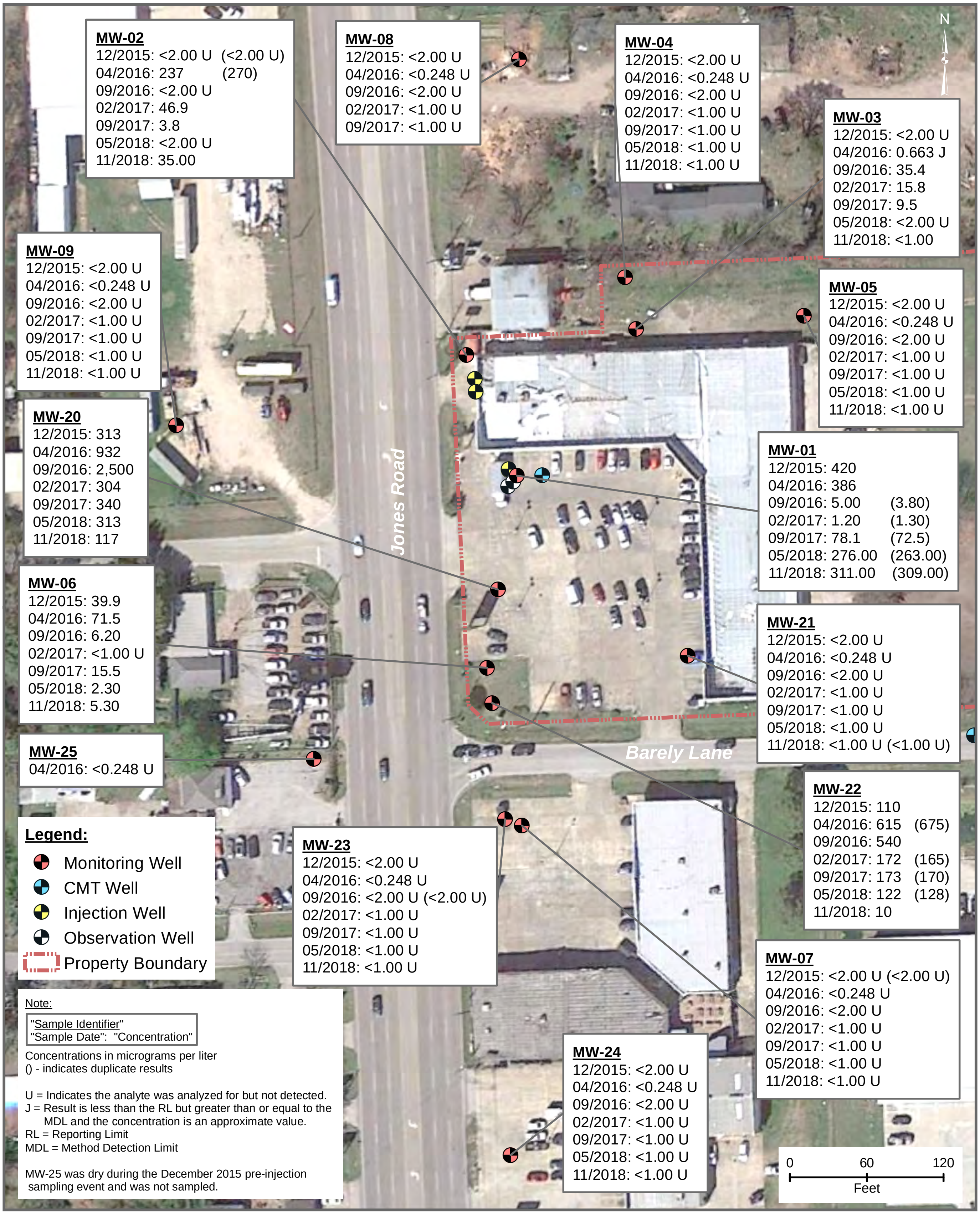


Image Source: GoogleEarth Pro, 2016

Remedial Action
Jones Road Ground Water Plume
Houston, Harris County, Texas

Figure 6
Vinyl Chloride Results

2019-03-06 R:\Federal\EPA\RAC II\0070-Jones Road RD\GIS\MXDs\201902\JonesPCE201902.mxd EA-Dallas rdolezal

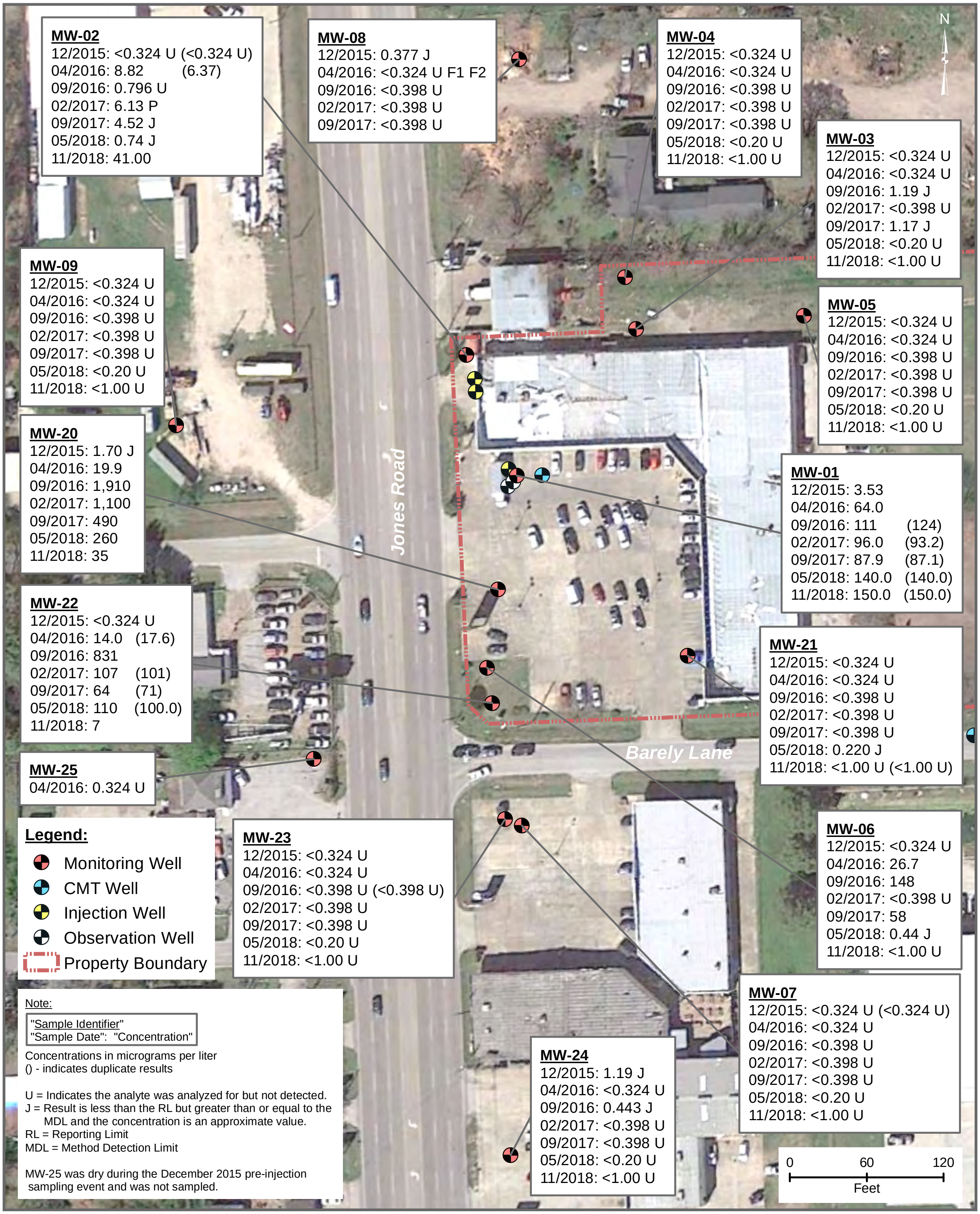


Image Source: GoogleEarth Pro, 2016

Remedial Action
Jones Road Ground Water Plume
Houston, Harris County, Texas

Figure 7
Ethene Results

2019 -03-06 R:\Federal\EPA\RAC II\0070-Jones Road RD\GIS\MXDs\201902\JonesPCE201902.mxd EA-Dallas rdolezal

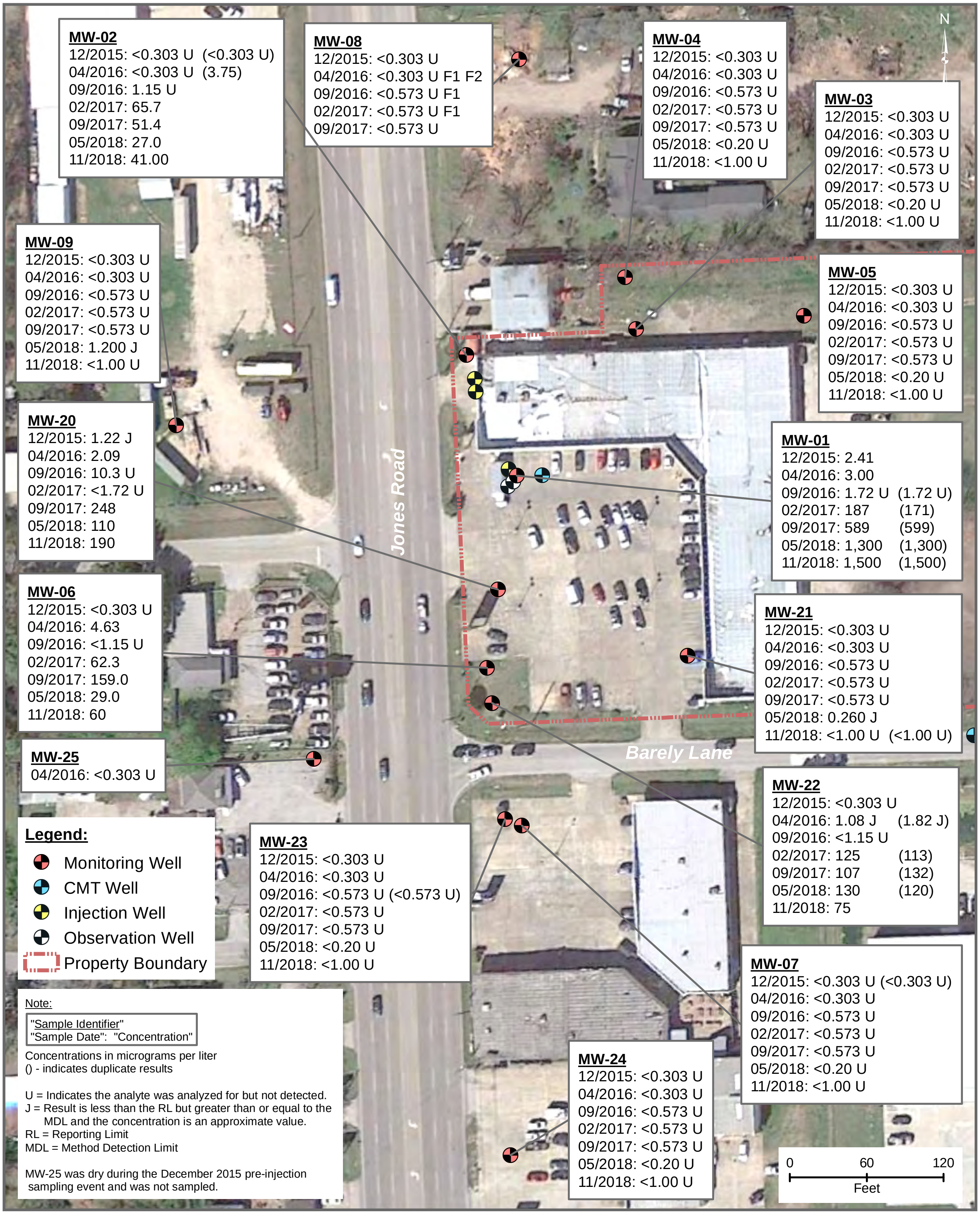


Image Source: GoogleEarth Pro, 2016

Remedial Action
Jones Road Ground Water Plume
Houston, Harris County, Texas

Figure 8
Ethane Results

2019 -03-06 R:\Federal\EPA\RAC II\0070-Jones Road RD\GIS\MXDs\201902\JonesPCE201902.mxd EA-Dallas rdolezal

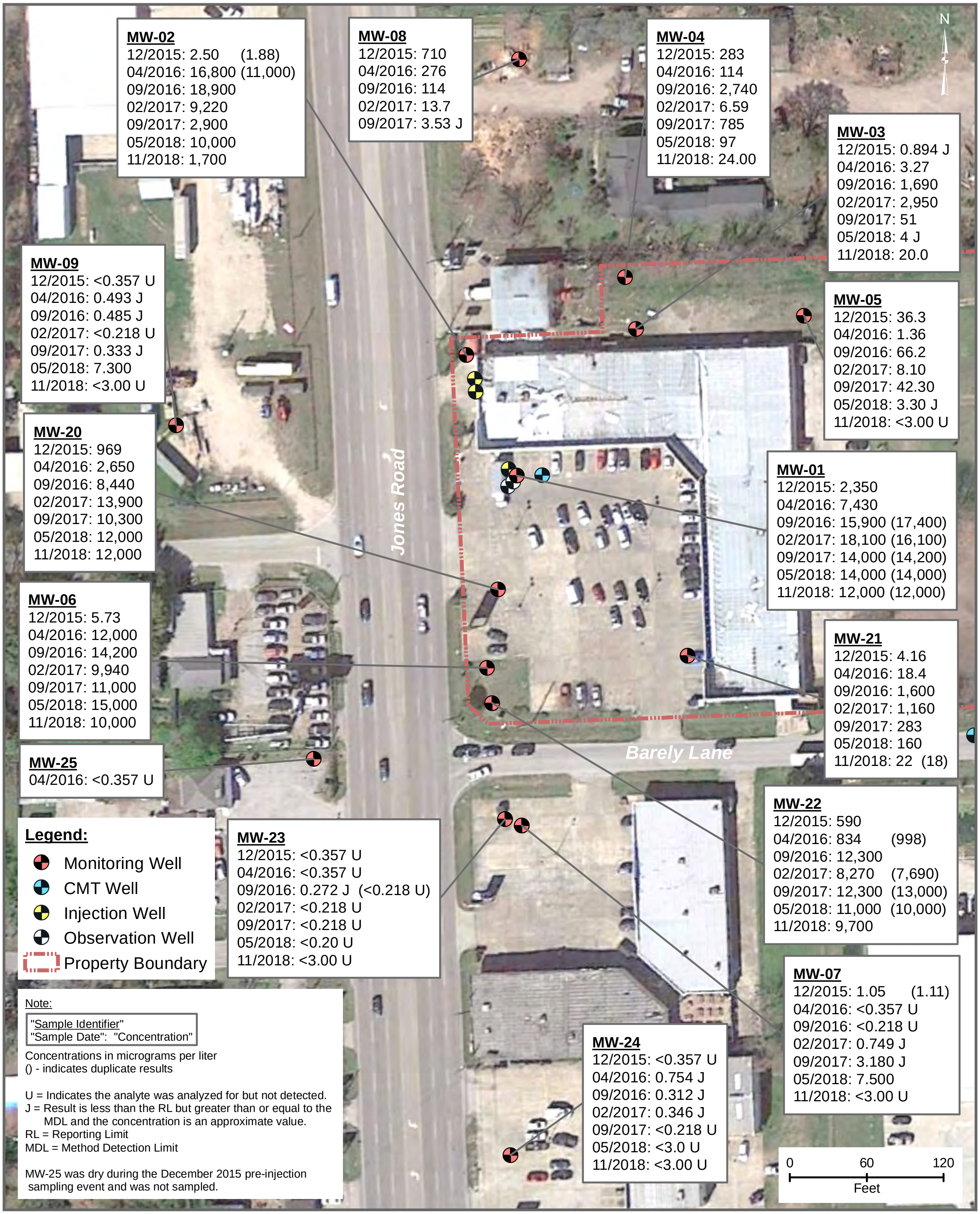


Image Source: GoogleEarth Pro, 2016

Figure 9
Methane Results

Remedial Action
Jones Road Ground Water Plume
Houston, Harris County, Texas

2019-03-06 R:\Federal\EPA\RAC II\0070-Jones Road RD\GIS\MXDs\201902\JonesPCE201902.mxd EA-Dallas rdolezal

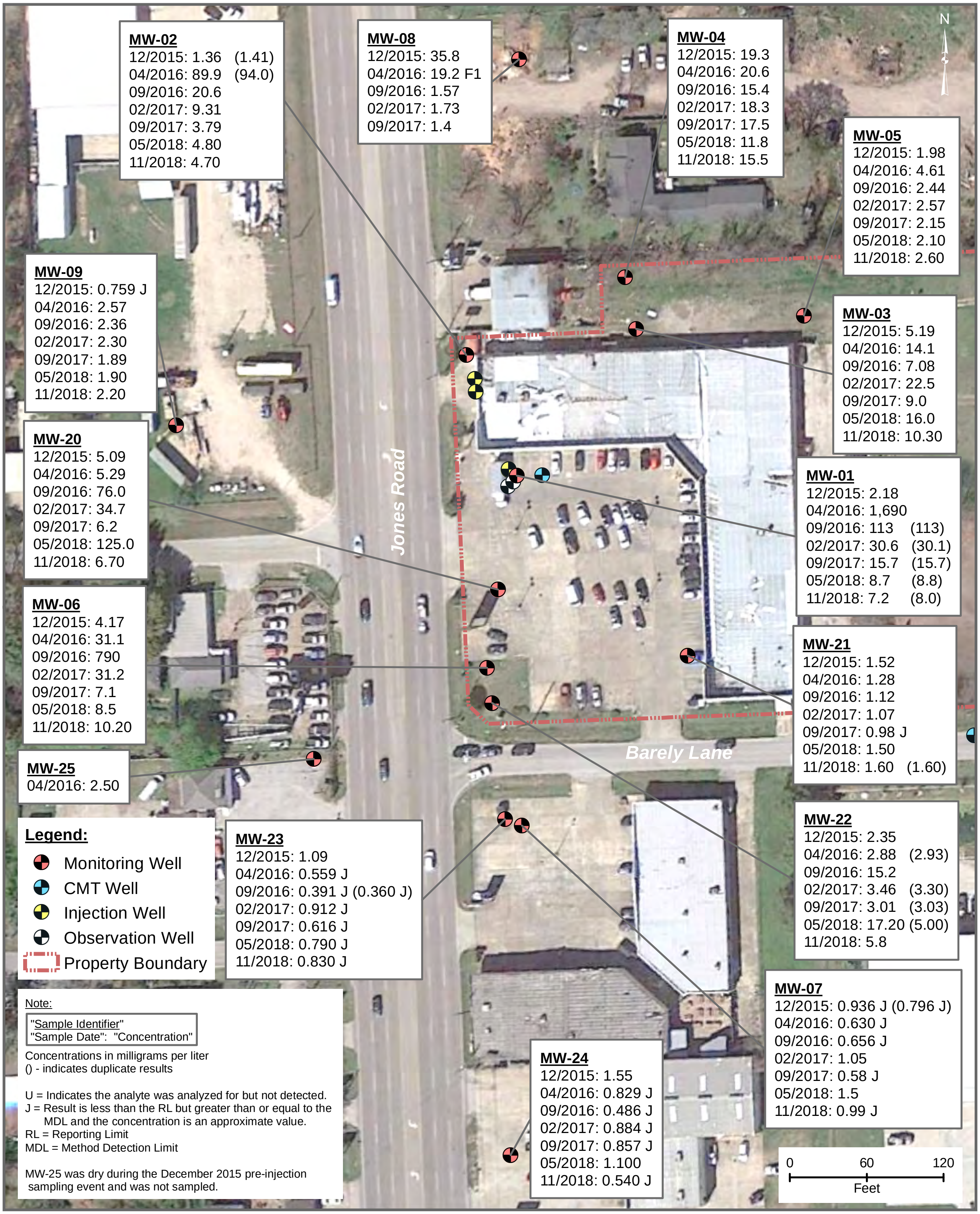


Image Source: GoogleEarth Pro, 2016

Figure 10
Total Organic Carbon Results

Remedial Action
Jones Road Ground Water Plume
Houston, Harris County, Texas

2019 -03-06 R:\Federal\EPA\RAC II\0070-Jones Road RD\GIS\MXDs\201902\JonesPCE201902.mxd EA-Dallas rdolezal

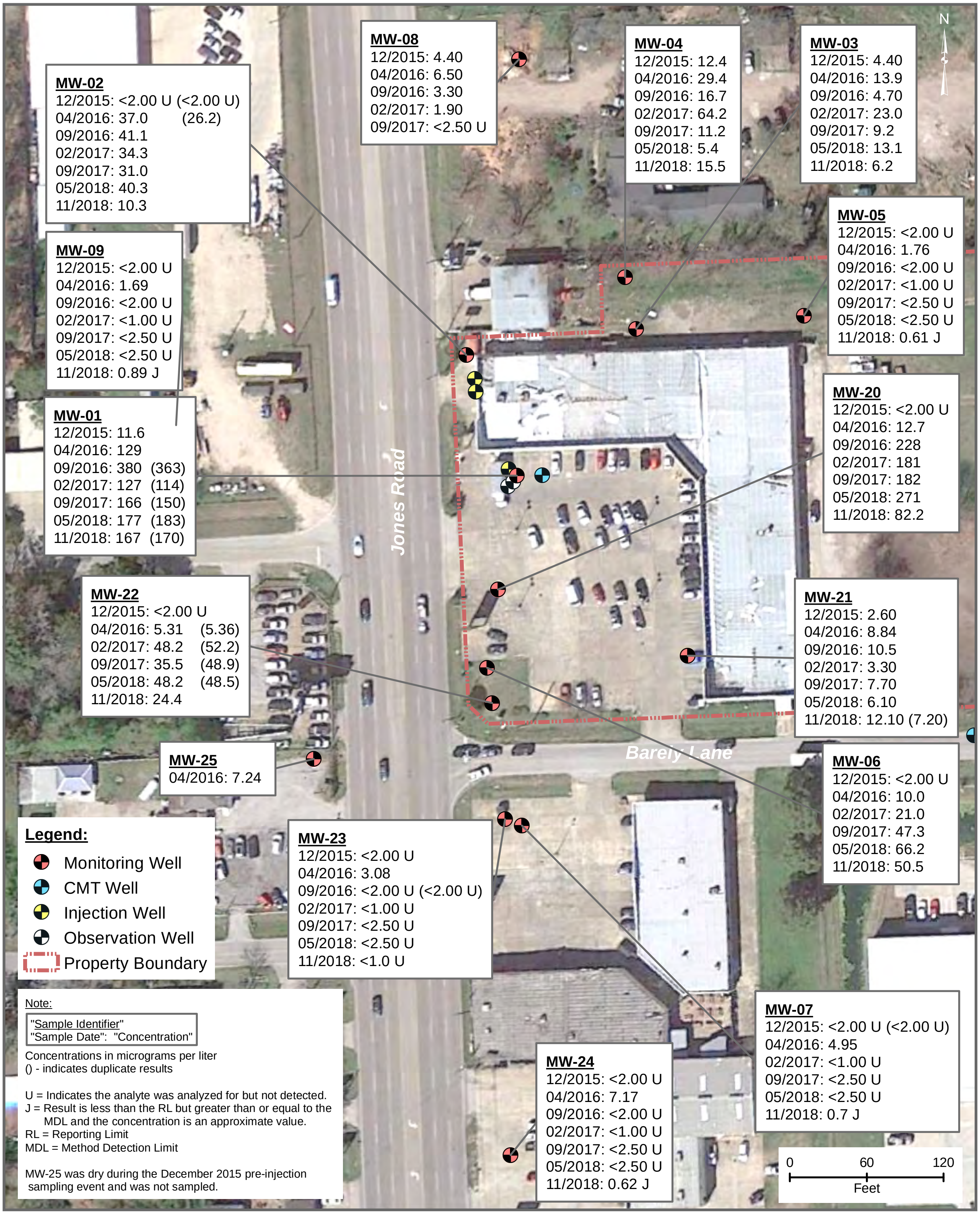


Image Source: GoogleEarth Pro, 2016

Remedial Action
Jones Road Ground Water Plume
Houston, Harris County, Texas

Figure 11
Dissolved Arsenic Results

2019-03-06 R:\Federal\EPA\RAC II\0070-Jones Road RD\GIS\MXDs\201902\JonesPCE201902.mxd EA-Dallas rdolezal

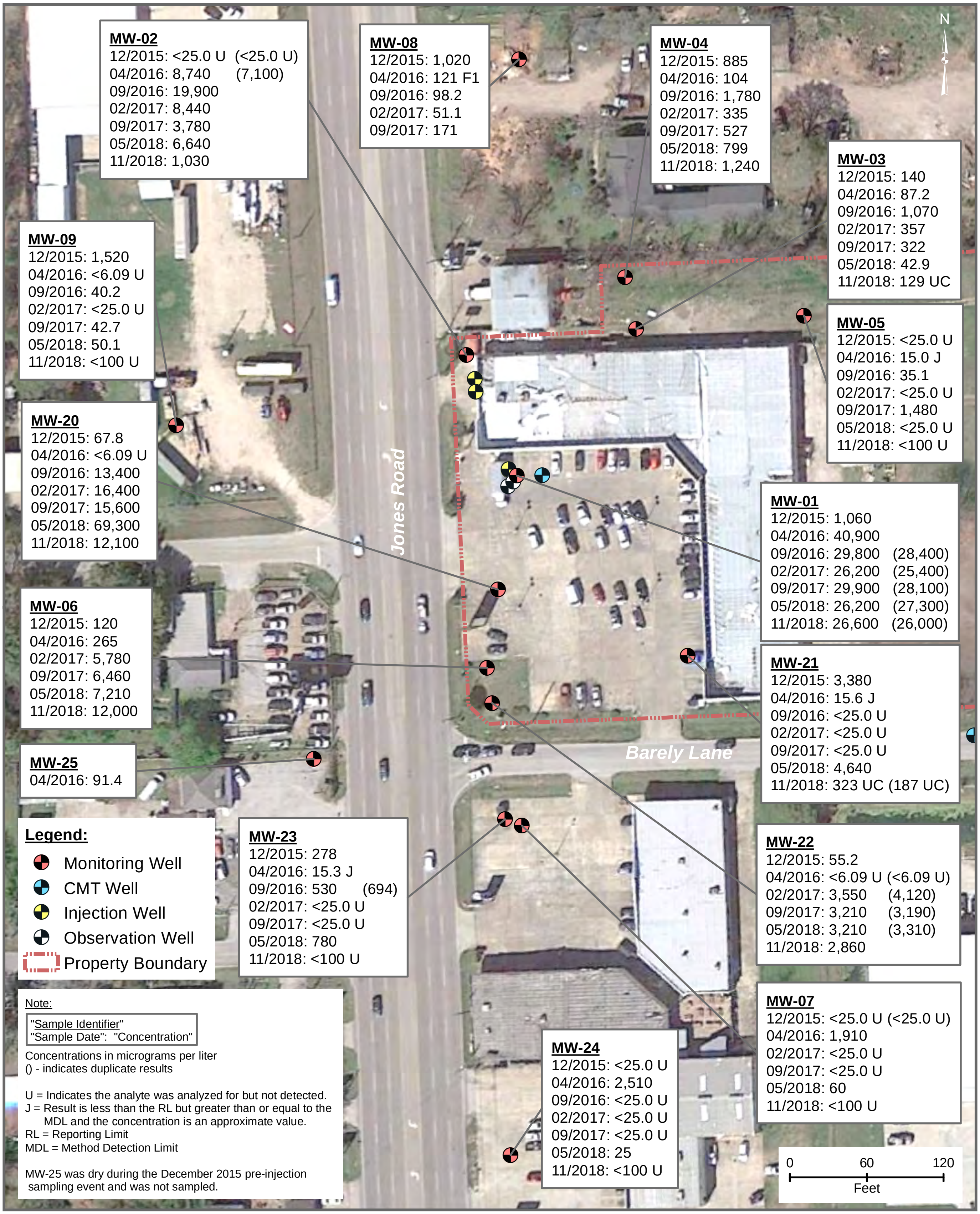


Image Source: GoogleEarth Pro, 2016

Figure 12
Dissolved Iron Results

Remedial Action
Jones Road Ground Water Plume
Houston, Harris County, Texas

2019 -03-06 R:\Federal\EPA\RAC II\0070-Jones Road RD\GIS\MXDs\201902\JonesPCE201902.mxd EA-Dallas rdolezal

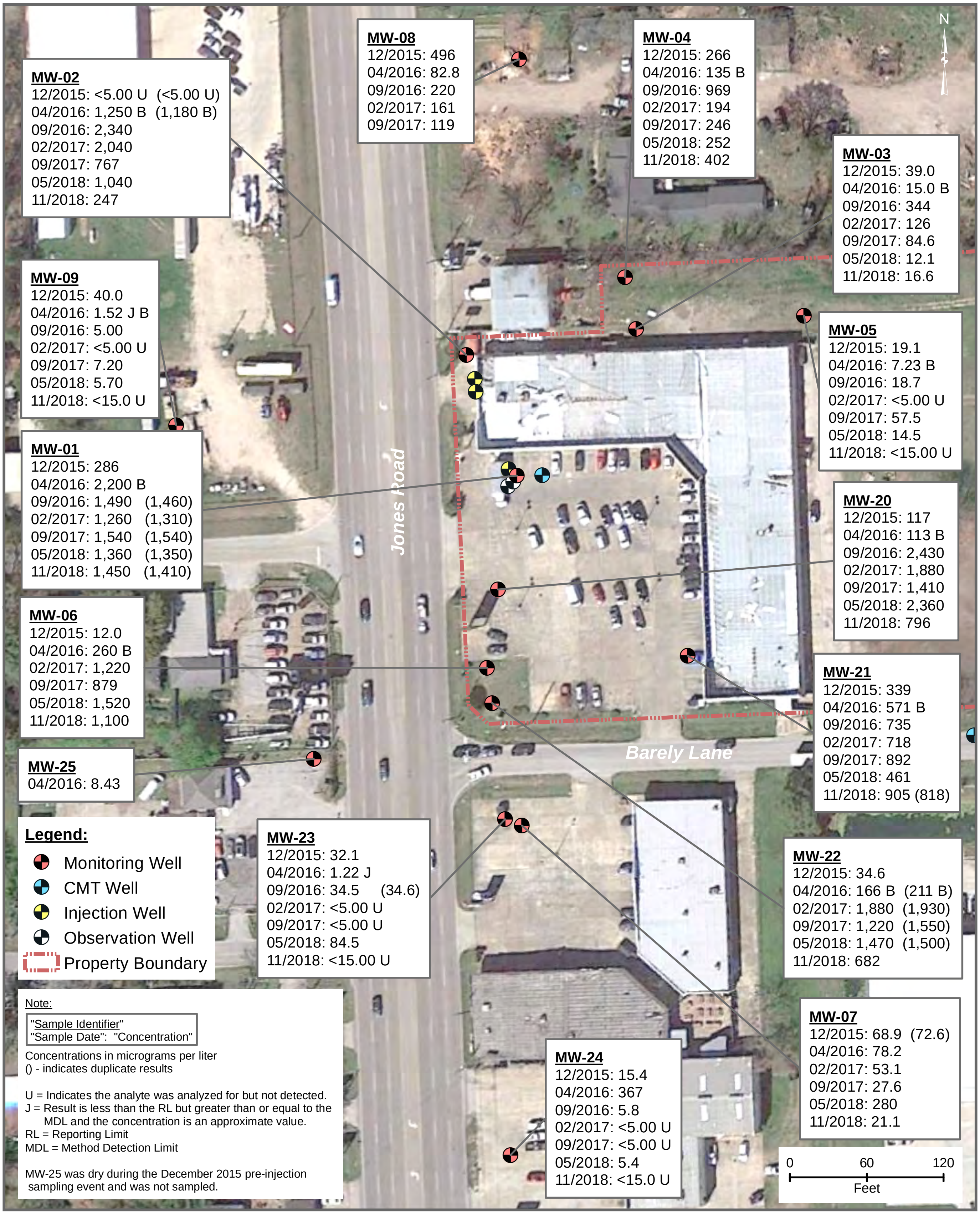


Image Source: GoogleEarth Pro, 2016

Remedial Action
Jones Road Ground Water Plume
Houston, Harris County, Texas

Figure 13
Dissolved Manganese Results

2019-03-06 R:\Federal\EPA\RAC II\0070-Jones Road RD\GIS\MXDs\201902\JonesPCE201902.mxd EA-Dallas rdolezal

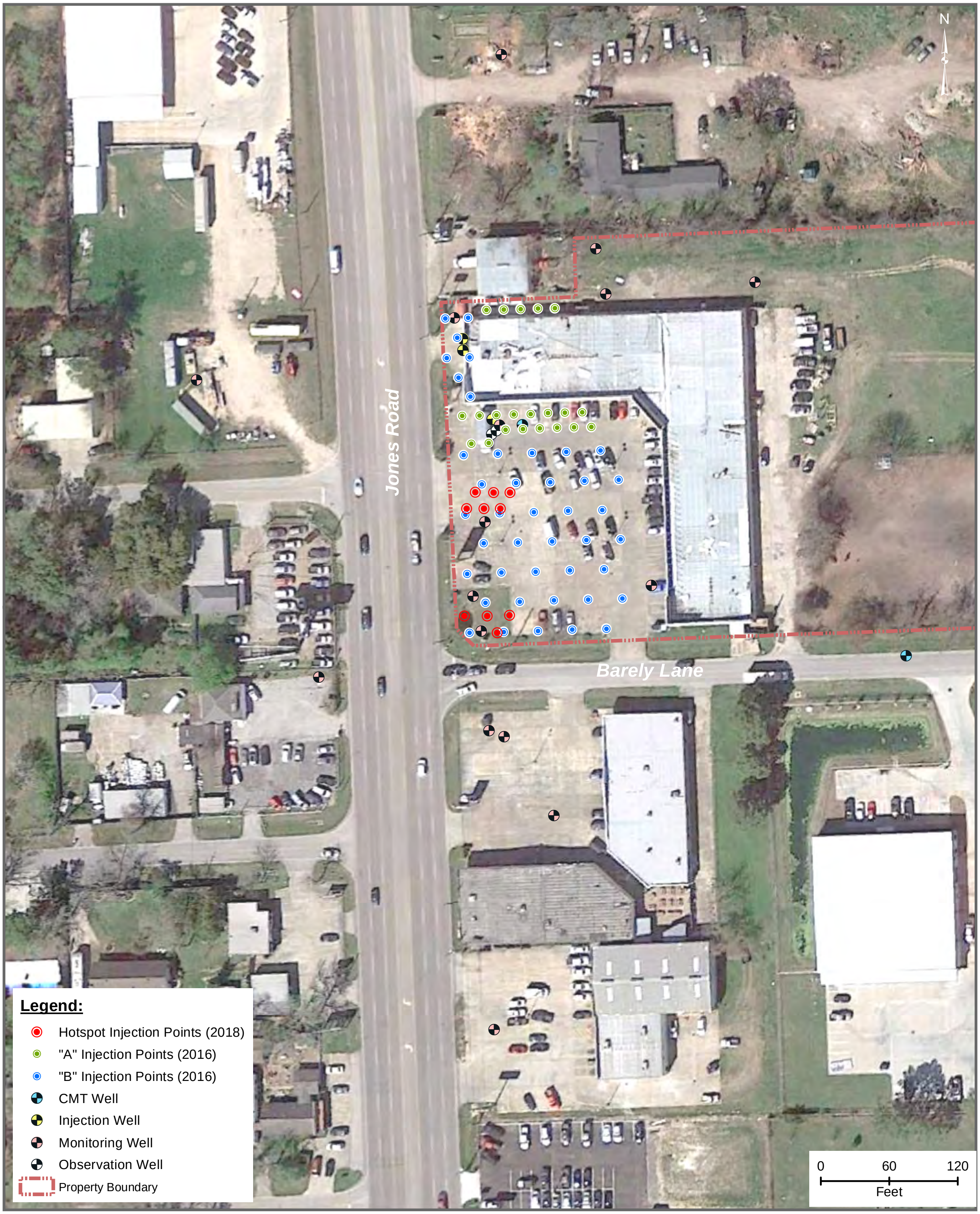


Image Source: GoogleEarth Pro, 2016

Figure 14
Product Injection Locations

Remedial Action
Jones Road Ground Water Plume
Houston, Harris County, Texas

2019-03-25 R:\Federal\EPA\RAC II\0070-Jones Road RD\GIS\MXDs\RD\Figxx_InjectionLocs201903.mxd EA-Dallas jschwertz

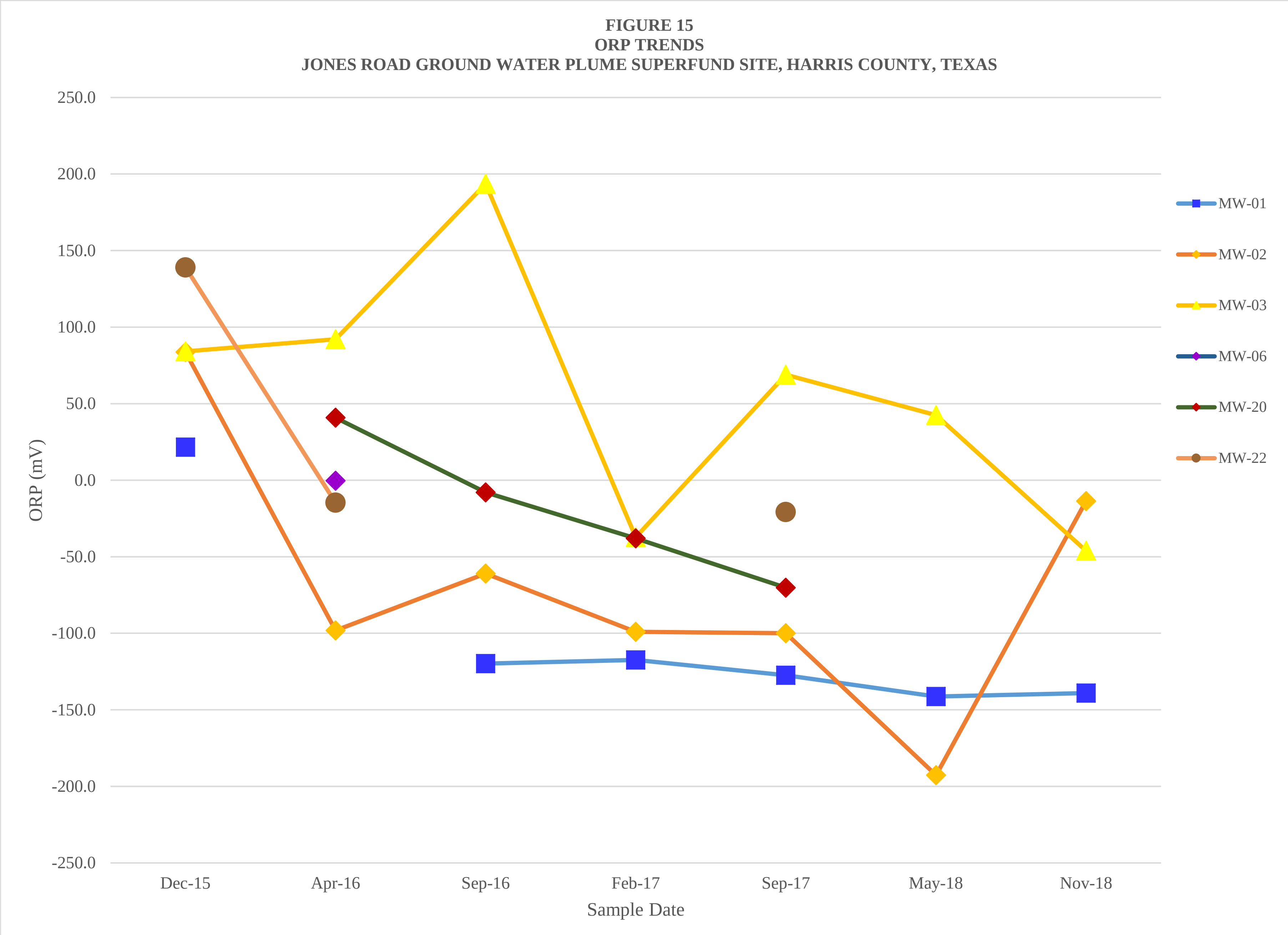


FIGURE 15
ORP TRENDS
JONES ROAD GROUND WATER PLUME SUPERFUND SITE, HARRIS COUNTY, TEXAS
250.0
200.0
150.0
100.0
50.0
0.0
-50.0
-100.0
-150.0
-200.0
-250.0
ORP (mV)
Dec-15
Apr-16
Sep-16
Feb-17
Sep-17
May-18
Nov-18
Sample Date
MW-01
MW-02
MW-03
MW-06
MW-20
MW-22

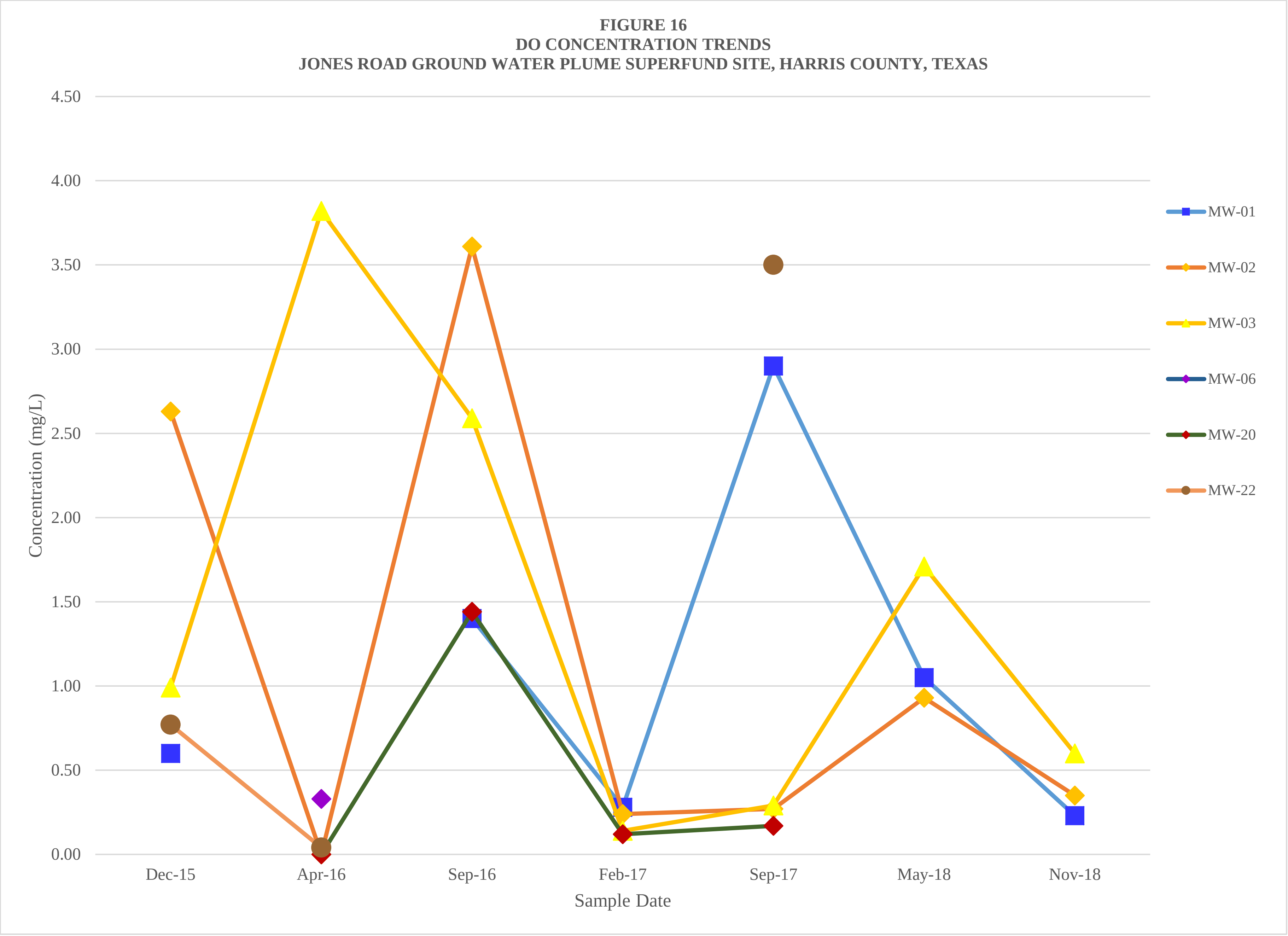


FIGURE 16
DO CONCENTRATION TRENDS
JONES ROAD GROUND WATER PLUME SUPERFUND SITE, HARRIS COUNTY, TEXAS
4.50
4.00
3.50
3.00
2.50
2.00
1.50
1.00
0.50
0.00
Concentration (mg/L)
Dec-15
Apr-16
Sep-16
Feb-17
Sep-17
May-18
Nov-18
Sample Date
MW-01
MW-02
MW-03
MW-06
MW-20
MW-22

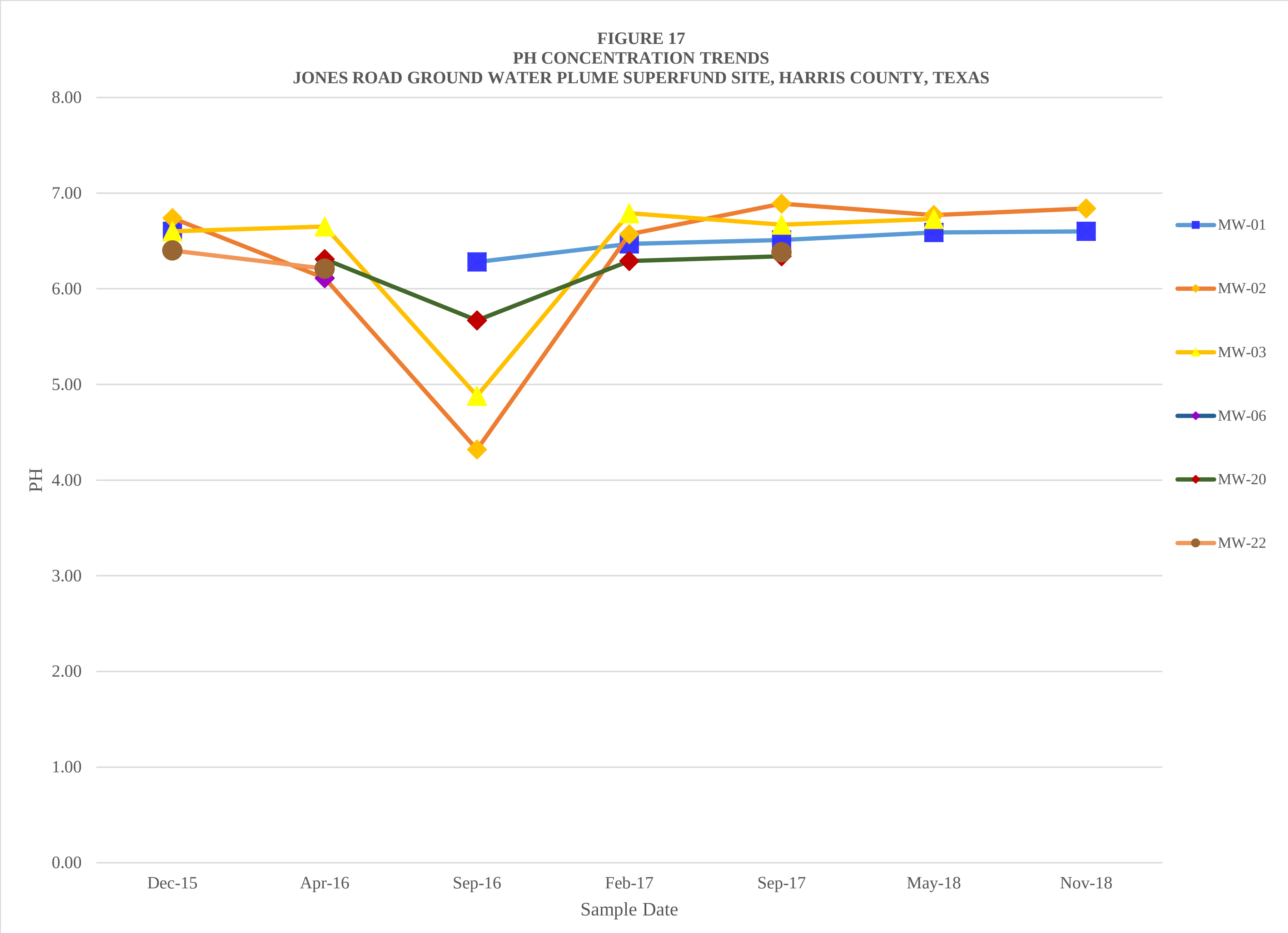


FIGURE 17
PH CONCENTRATION TRENDS
JONES ROAD GROUND WATER PLUME SUPERFUND SITE, HARRIS COUNTY, TEXAS
8.00
7.00
6.00
5.00
4.00
3.00
2.00
1.00
0.00
PH
Dec-15
Apr-16
Sep-16
Feb-17
Sep-17
May-18
Nov-18
Sample Date
MW-01
MW-02
MW-03
MW-06
MW-20
MW-22

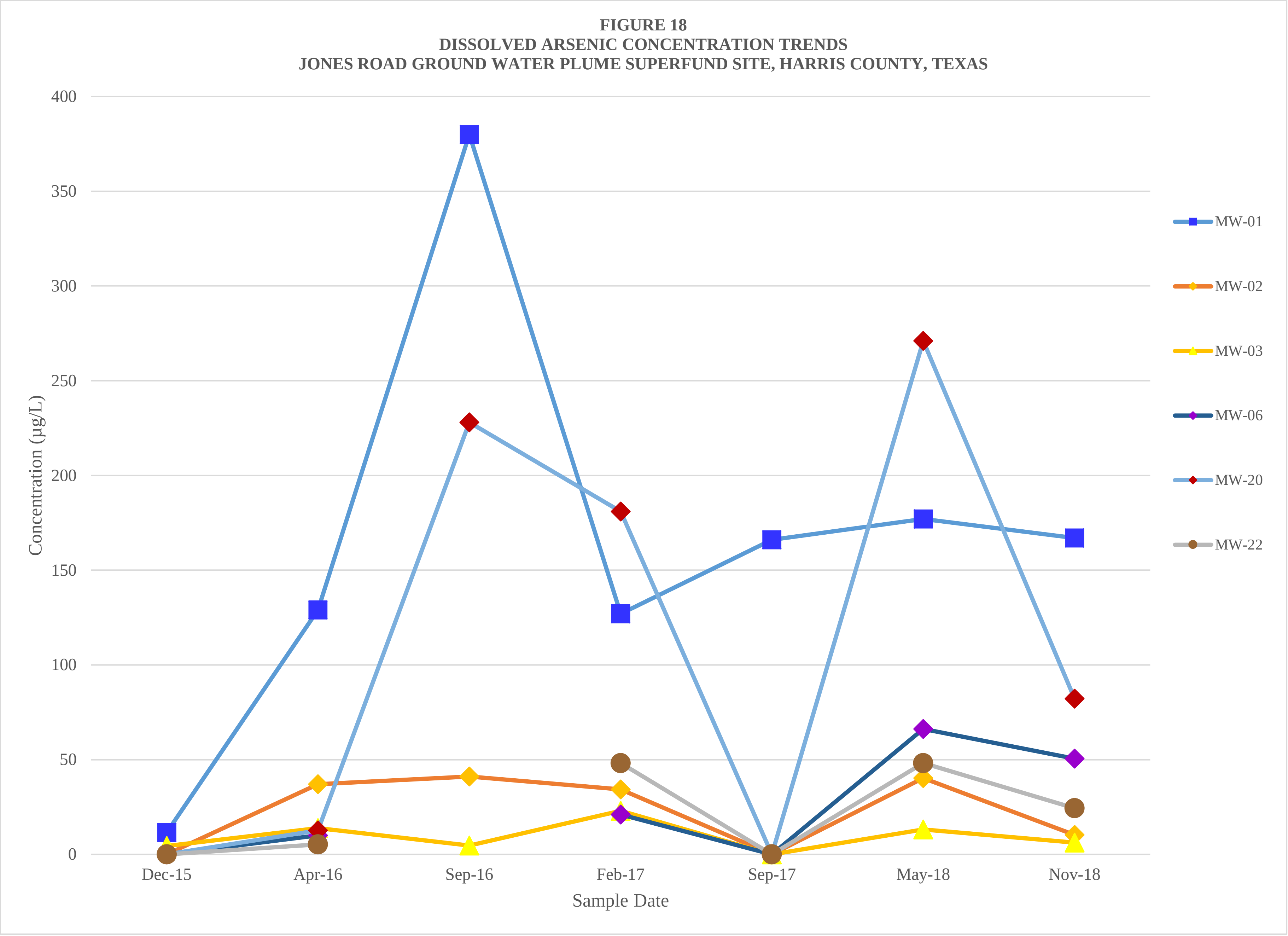


FIGURE 18
DISSOLVED ARSENIC CONCENTRATION TRENDS
JONES ROAD GROUND WATER PLUME SUPERFUND SITE, HARRIS COUNTY, TEXAS
Concentration (µg/L)
400
350
300
250
200
150
100
50
0
Dec-15
Apr-16
Sep-16
Feb-17
Sep-17
May-18
Nov-18
Sample Date
MW-01
MW-02
MW-03
MW-06
MW-20
MW-22

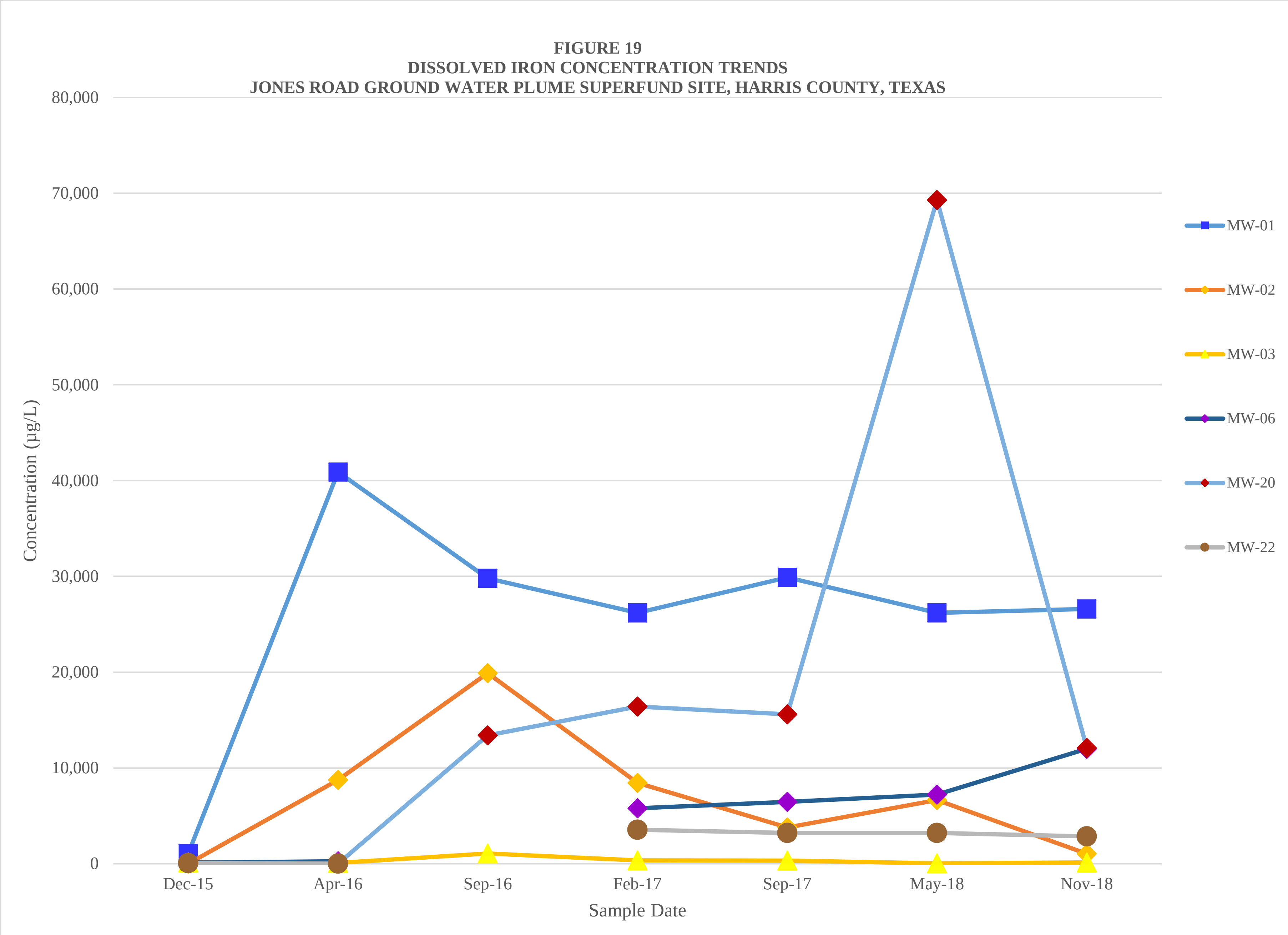


FIGURE 19
DISSOLVED IRON CONCENTRATION TRENDS
JONES ROAD GROUND WATER PLUME SUPERFUND SITE, HARRIS COUNTY, TEXAS
80,000
70,000
60,000
50,000
40,000
30,000
20,000
10,000
0
Concentration (µg/L)
Dec-15
Apr-16
Sep-16
Feb-17
Sep-17
May-18
Nov-18
Sample Date
MW-01
MW-02
MW-03
MW-06
MW-20
MW-22

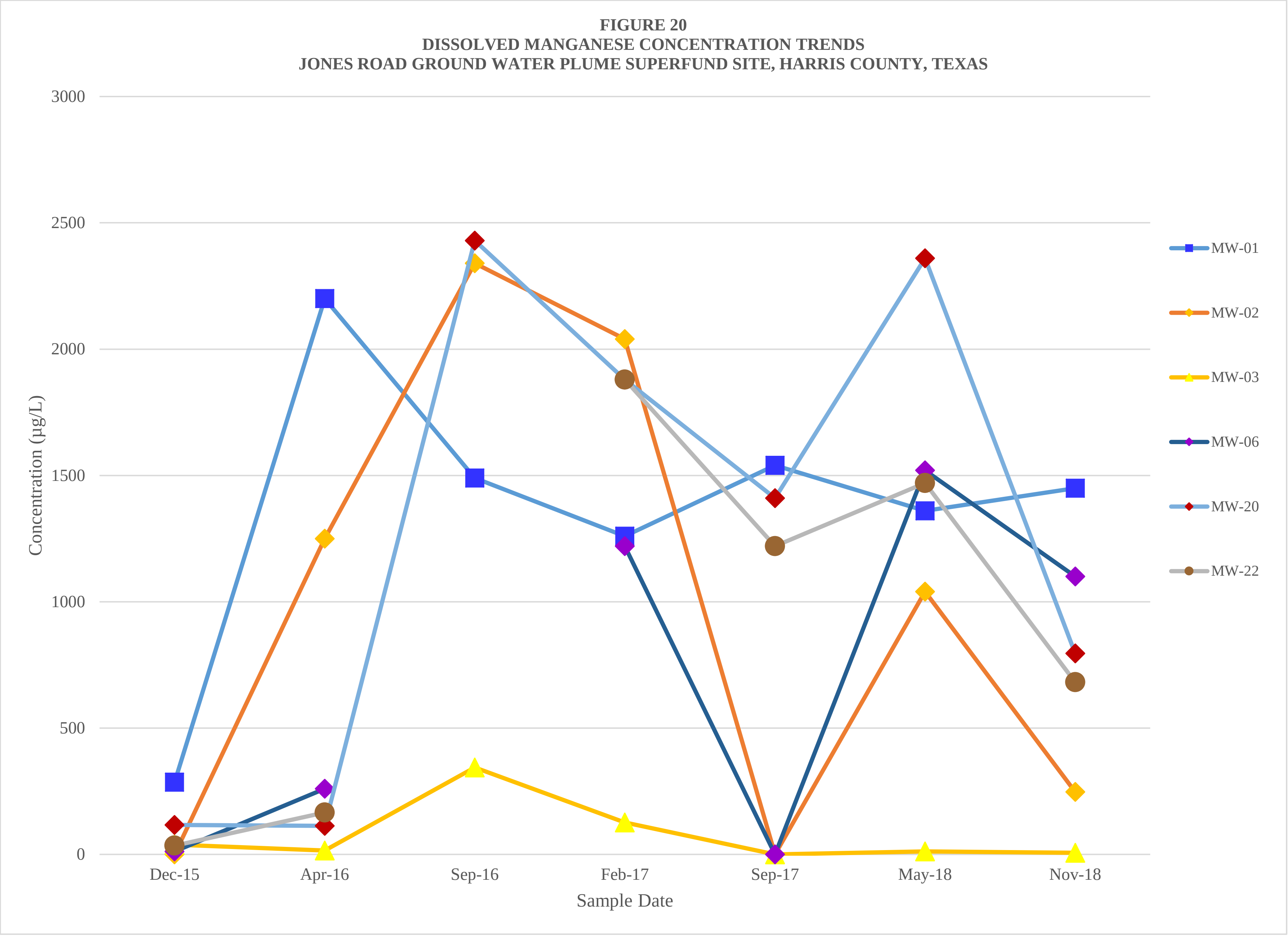
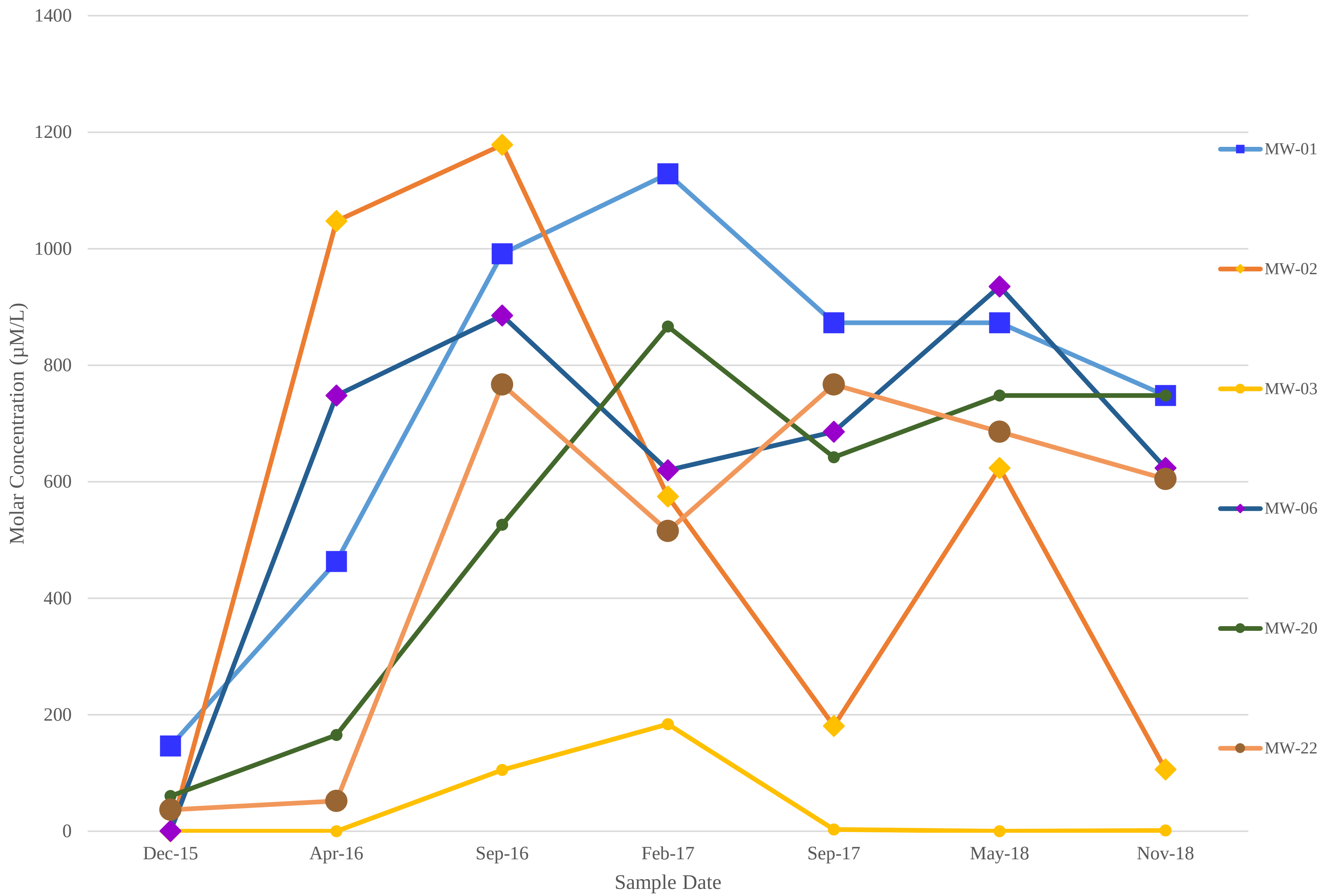


FIGURE 20
DISSOLVED MANGANESE CONCENTRATION TRENDS
JONES ROAD GROUND WATER PLUME SUPERFUND SITE, HARRIS COUNTY, TEXAS
3000
2500
2000
1500
1000
500
0
Concentration (µg/L)
Dec-15
Apr-16
Sep-16
Feb-17
Sep-17
May-18
Nov-18
Sample Date
MW-01
MW-02
MW-03
MW-06
MW-20
MW-22

FIGURE 21
METHANE CONCENTRATION TRENDS
JONES ROAD GROUND WATER PLUME SUPERFUND SITE, HARRIS COUNTY, TEXAS



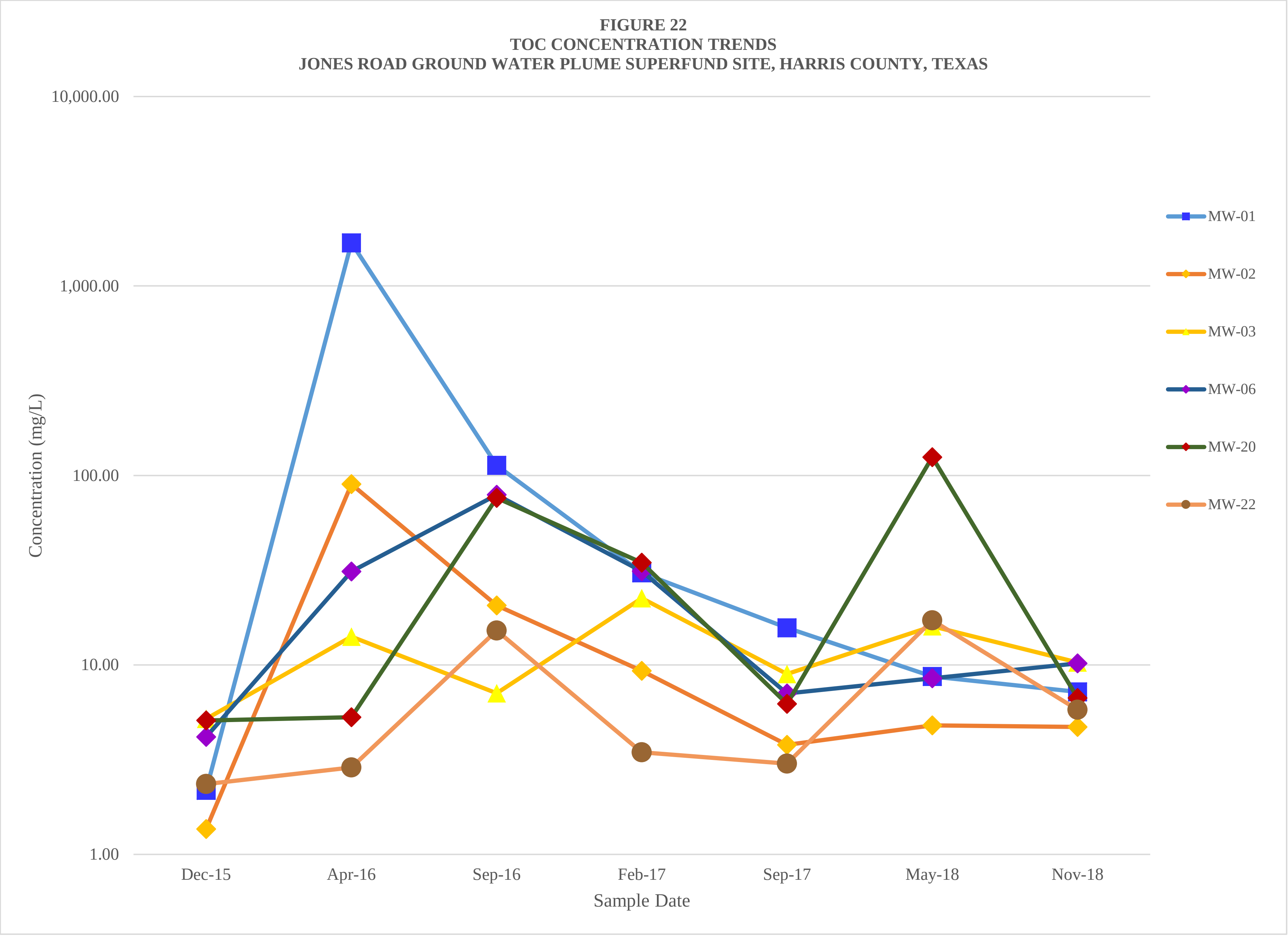


FIGURE 22
TOC CONCENTRATION TRENDS
JONES ROAD GROUND WATER PLUME SUPERFUND SITE, HARRIS COUNTY, TEXAS
10,000.00
1,000.00
100.00
10.00
1.00
Concentration (mg/L)
Dec-15
Apr-16
Sep-16
Feb-17
Sep-17
May-18
Nov-18
Sample Date
MW-01
MW-02
MW-03
MW-06
MW-20
MW-22

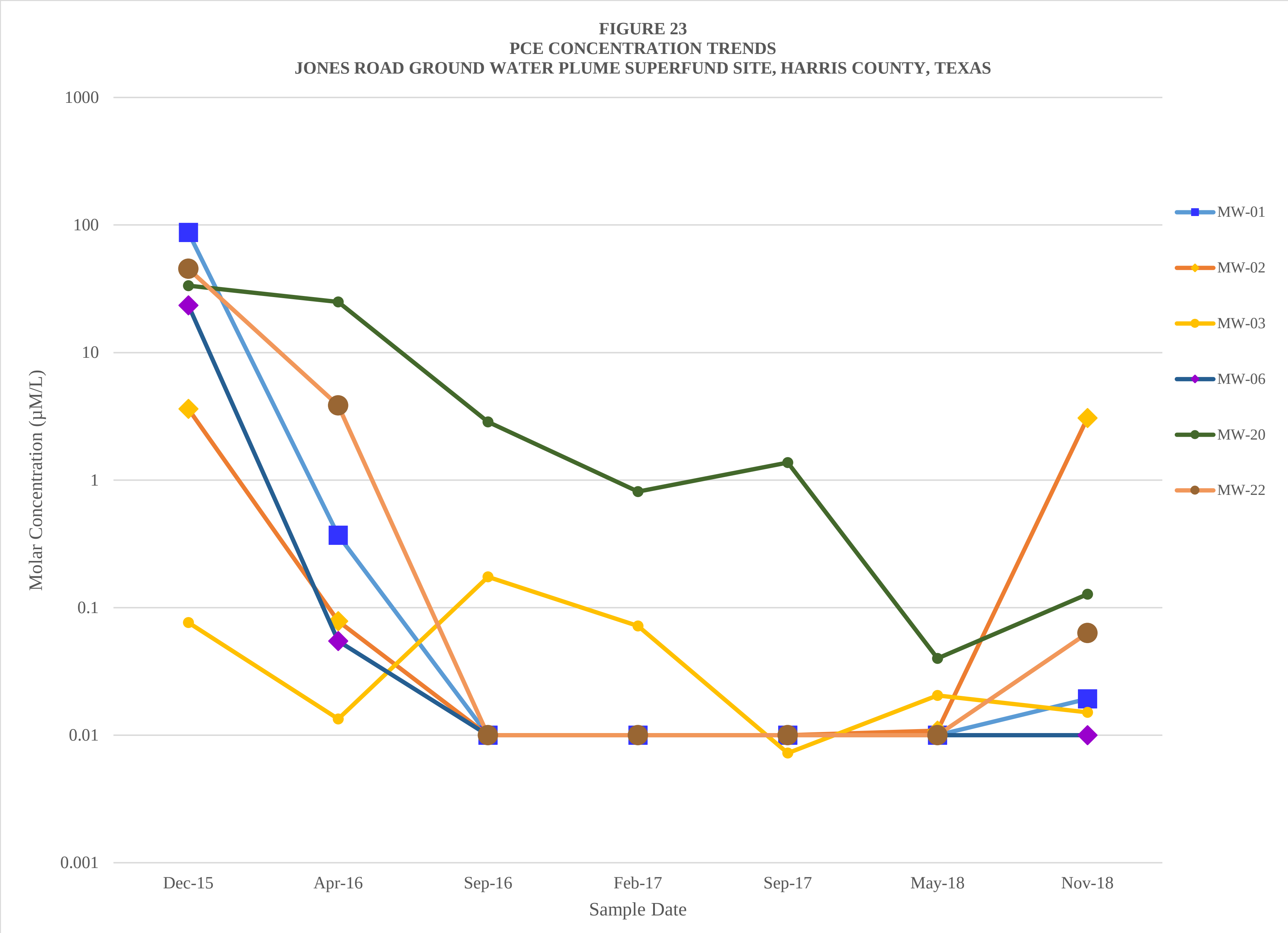


FIGURE 23
PCE CONCENTRATION TRENDS
JONES ROAD GROUND WATER PLUME SUPERFUND SITE, HARRIS COUNTY, TEXAS
1000
100
10
1
0.1
0.01
0.001
Molar Concentration (µM/L)
Dec-15
Apr-16
Sep-16
Feb-17
Sep-17
May-18
Nov-18
Sample Date
MW-01
MW-02
MW-03
MW-06
MW-20
MW-22

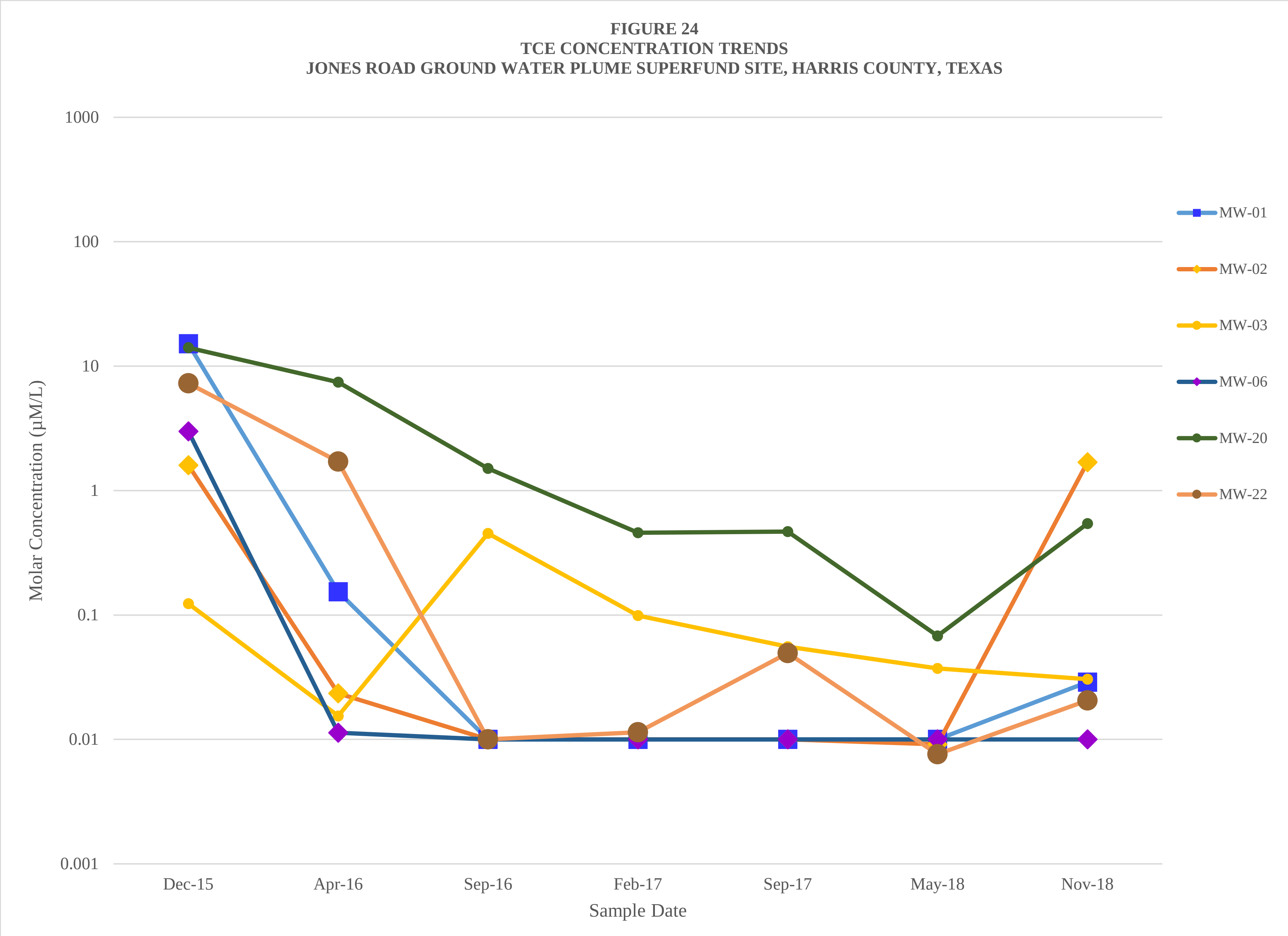


FIGURE 24
TCE CONCENTRATION TRENDS
JONES ROAD GROUND WATER PLUME SUPERFUND SITE, HARRIS COUNTY, TEXAS
1000
100
10
1
0.1
0.01
0.001
Molar Concentration (µM/L)
Dec-15
Apr-16
Sep-16
Feb-17
Sep-17
May-18
Nov-18
Sample Date
MW-01
MW-02
MW-03
MW-06
MW-20
MW-22

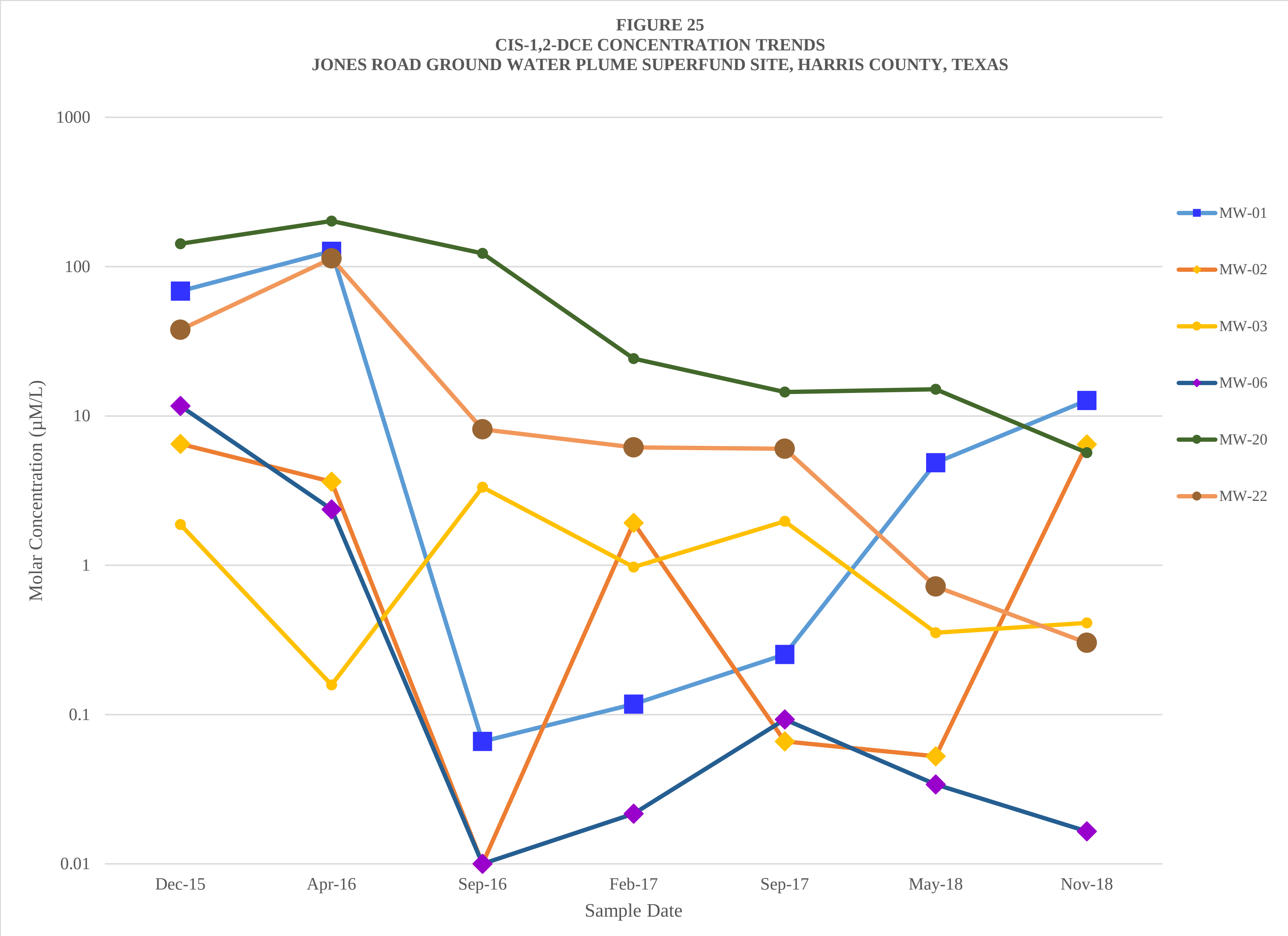


FIGURE 25
CIS-1,2-DCE CONCENTRATION TRENDS
JONES ROAD GROUND WATER PLUME SUPERFUND SITE, HARRIS COUNTY, TEXAS
1000
100
10
1
0.1
0.01
Molar Concentration (µM/L)
Dec-15
Apr-16
Sep-16
Feb-17
Sep-17
May-18
Nov-18
Sample Date
MW-01
MW-02
MW-03
MW-06
MW-20
MW-22

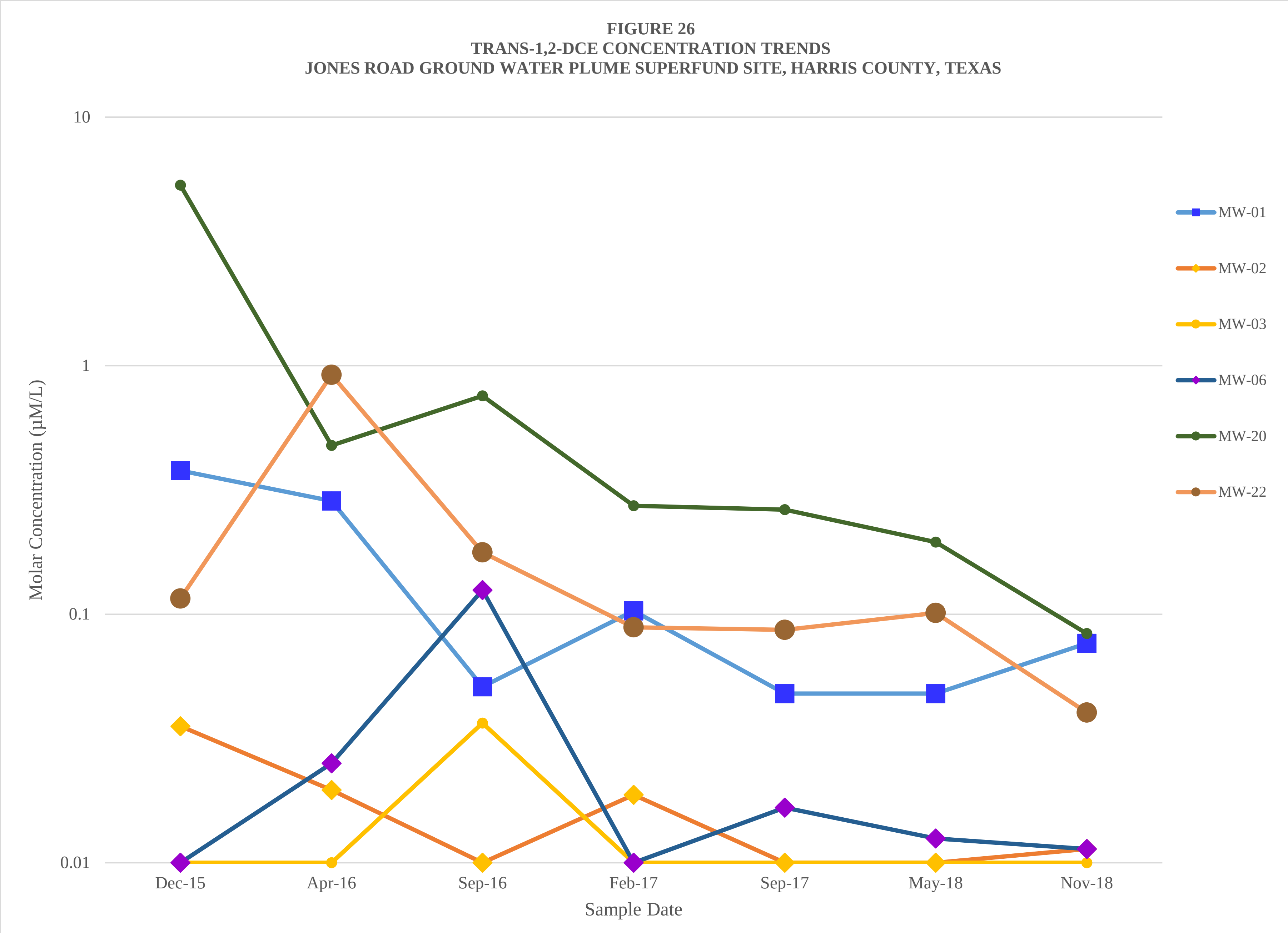
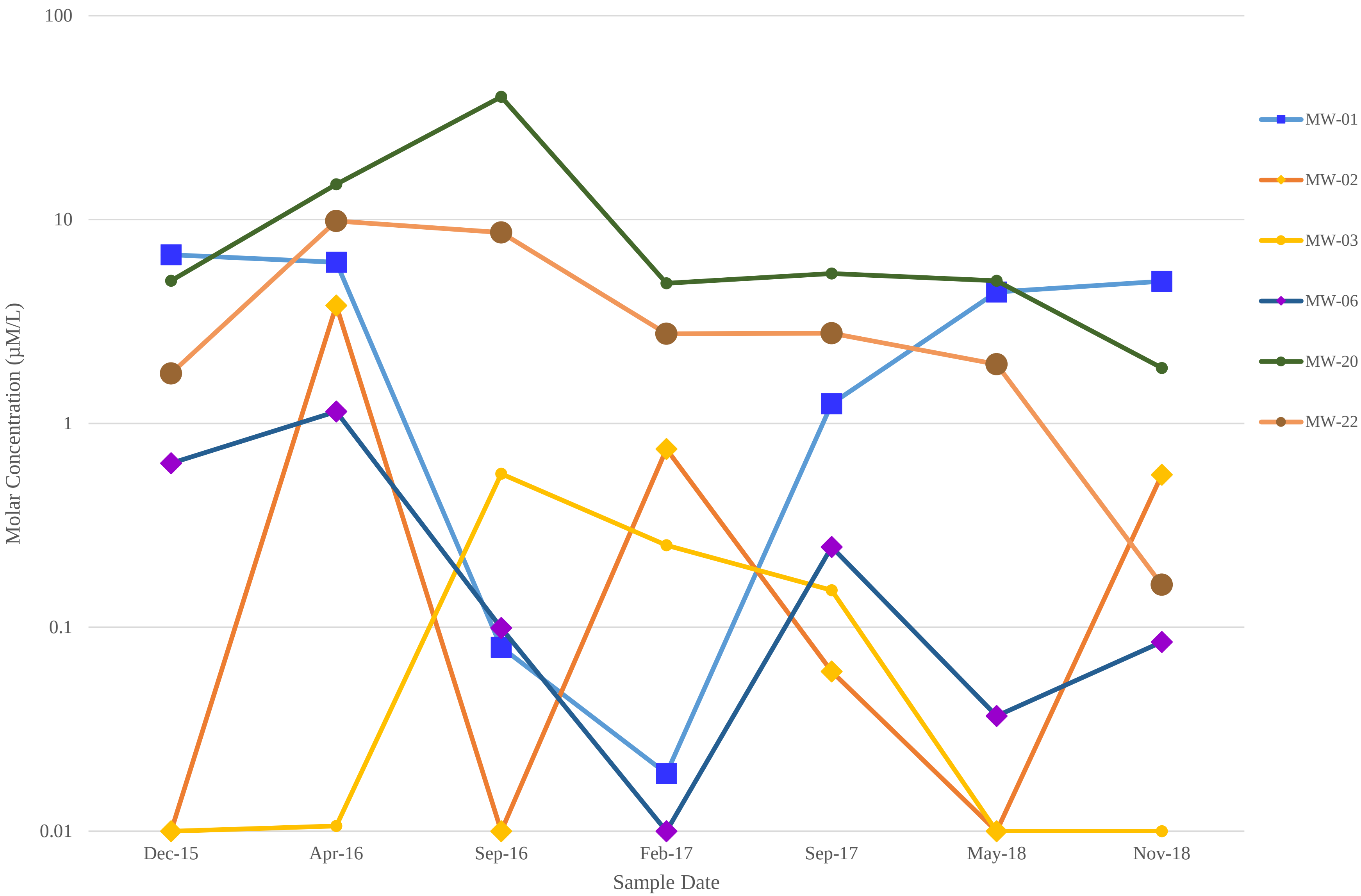


FIGURE 26
TRANS-1,2-DCE CONCENTRATION TRENDS
JONES ROAD GROUND WATER PLUME SUPERFUND SITE, HARRIS COUNTY, TEXAS
10
1
0.1
0.01
Molar Concentration (µM/L)
Dec-15
Apr-16
Sep-16
Feb-17
Sep-17
May-18
Nov-18
Sample Date
MW-01
MW-02
MW-03
MW-06
MW-20
MW-22

FIGURE 27
VINYL CHLORIDE CONCENTRATION TRENDS
JONES ROAD GROUND WATER PLUME SUPERFUND SITE, HARRIS COUNTY, TEXAS



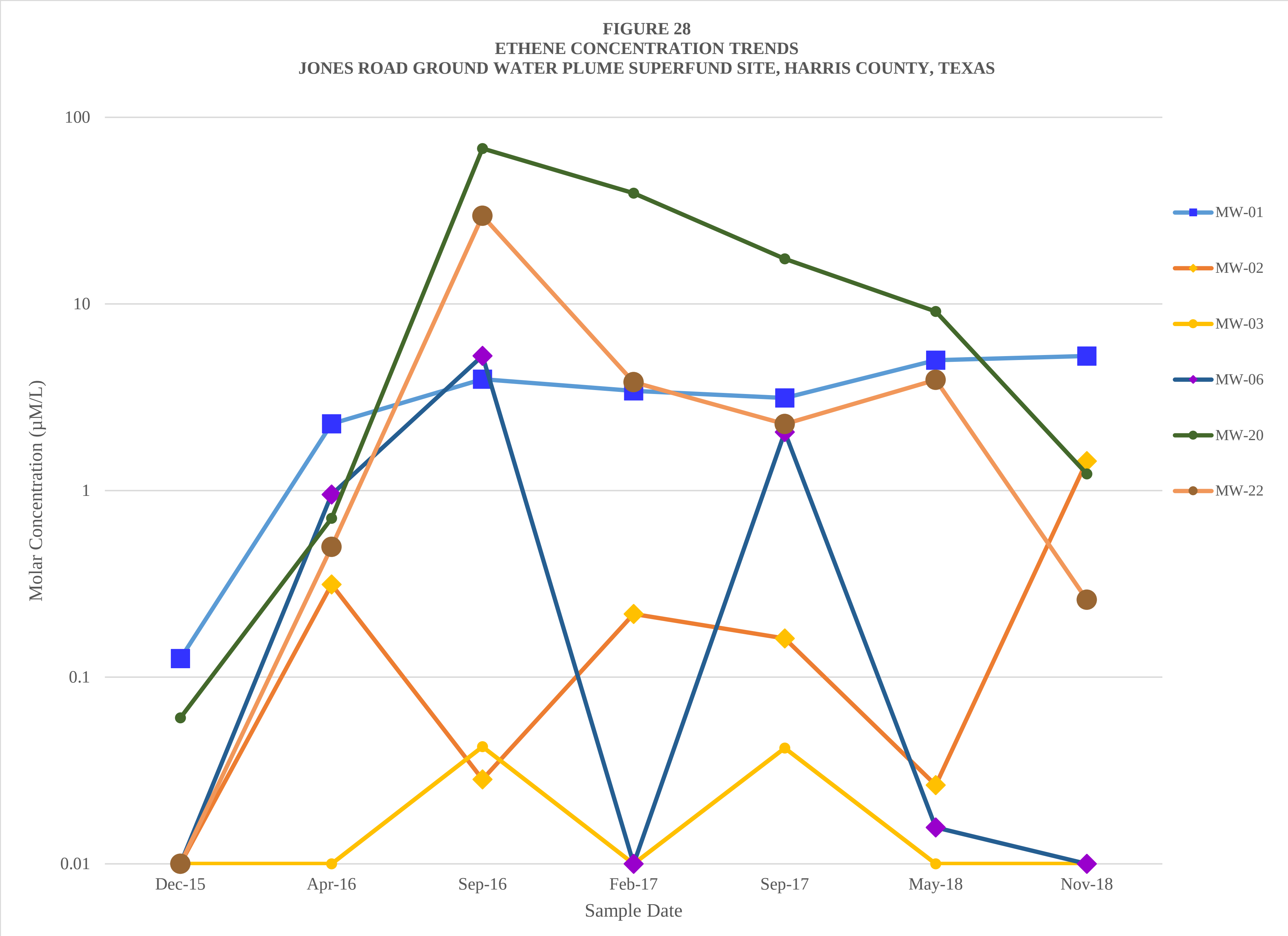


FIGURE 28
ETHENE CONCENTRATION TRENDS
JONES ROAD GROUND WATER PLUME SUPERFUND SITE, HARRIS COUNTY, TEXAS
100
10
1
0.1
0.01
Molar Concentration (µM/L)
Dec-15
Apr-16
Sep-16
Feb-17
Sep-17
May-18
Nov-18
Sample Date
MW-01
MW-02
MW-03
MW-06
MW-20
MW-22

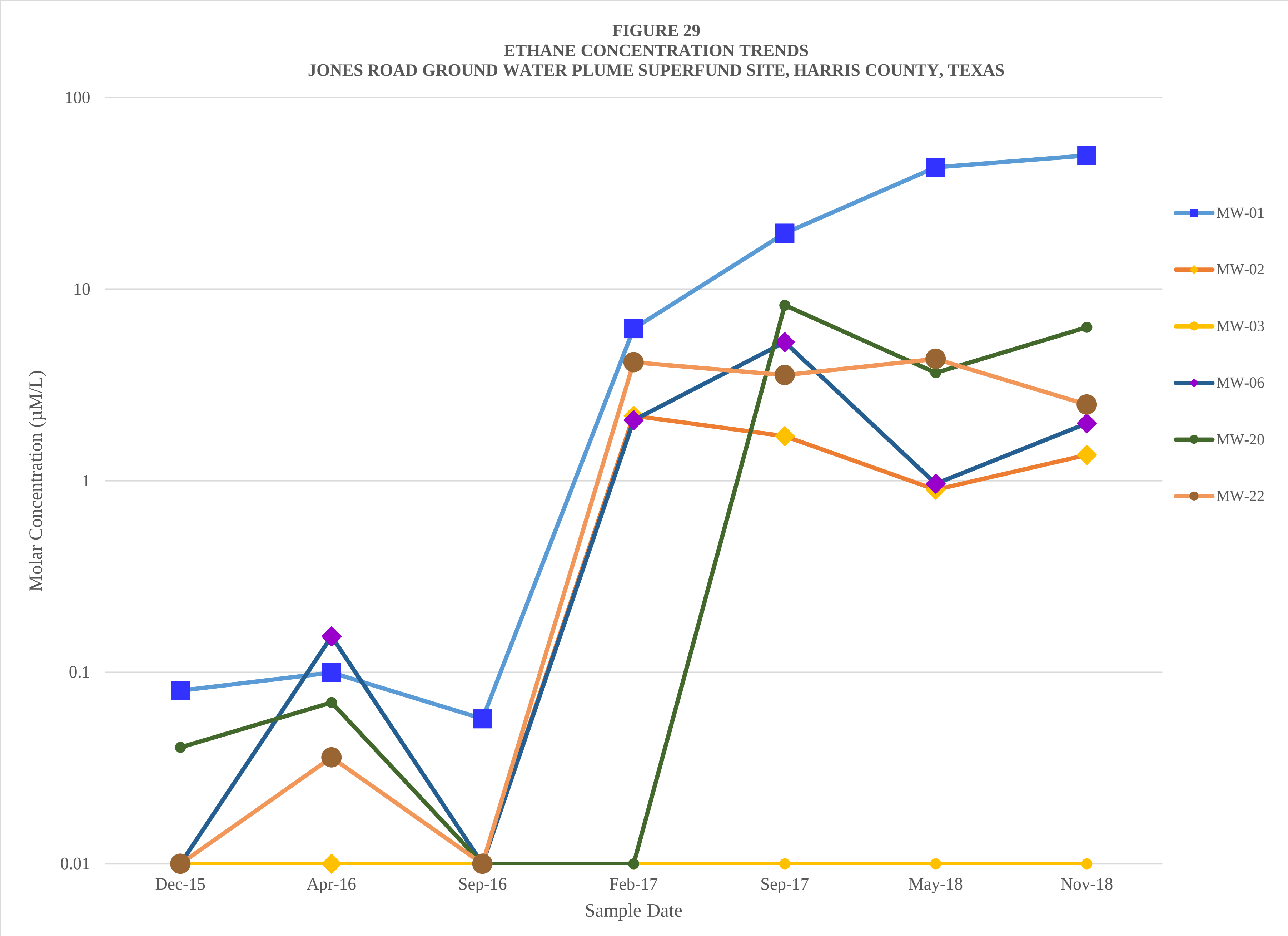
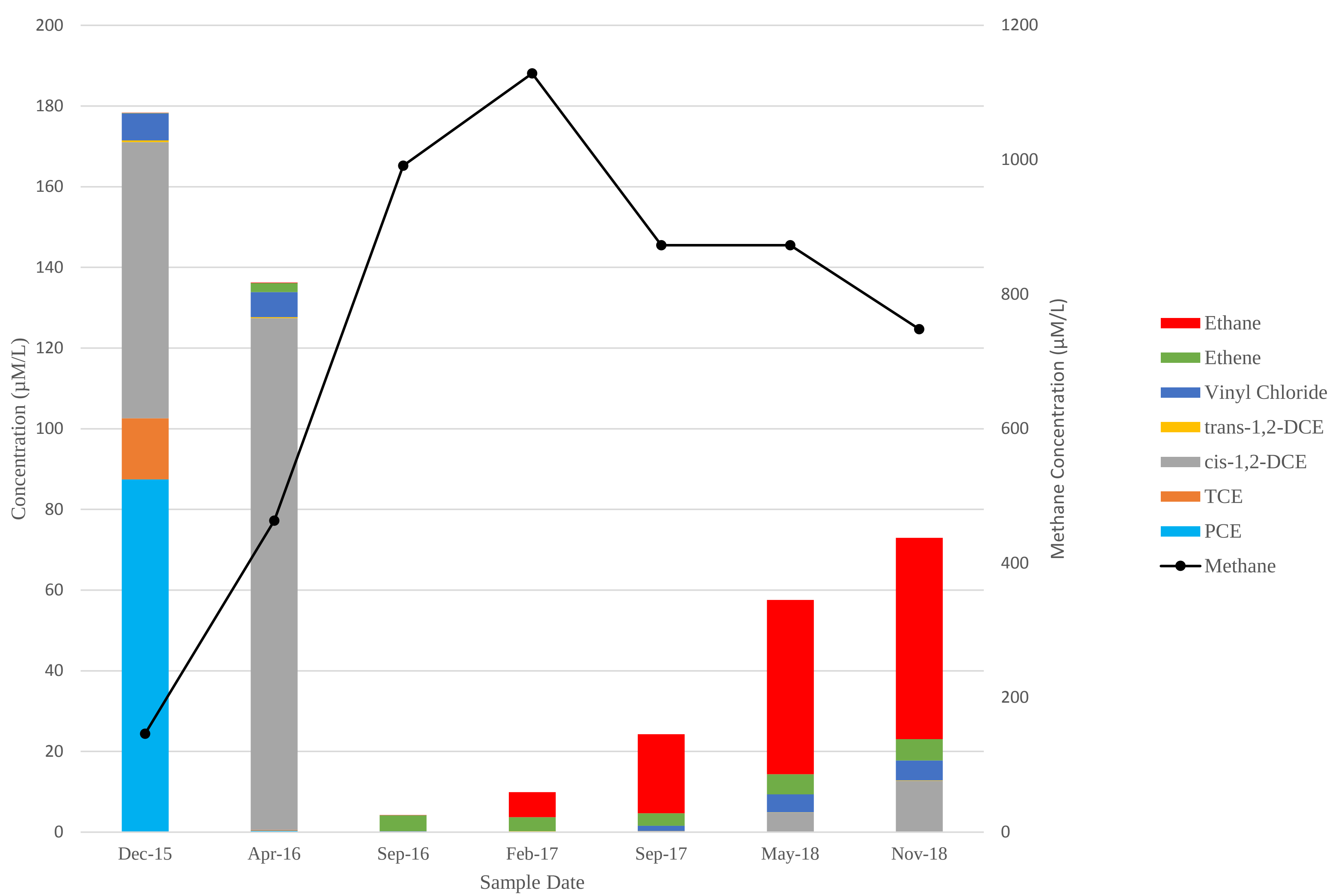


FIGURE 29
ETHANE CONCENTRATION TRENDS
JONES ROAD GROUND WATER PLUME SUPERFUND SITE, HARRIS COUNTY, TEXAS
100
10
1
0.1
0.01
Molar Concentration (µM/L)
Dec-15
Apr-16
Sep-16
Feb-17
Sep-17
May-18
Nov-18
Sample Date
MW-01
MW-02
MW-03
MW-06
MW-20
MW-22

FIGURE 30
MOLAR CONCENTRATIONS OF CHLORINATED ETHENES IN MW-01
JONES ROAD GROUND WATER PLUME SUPERFUND SITE, HARRIS COUNTY, TEXAS



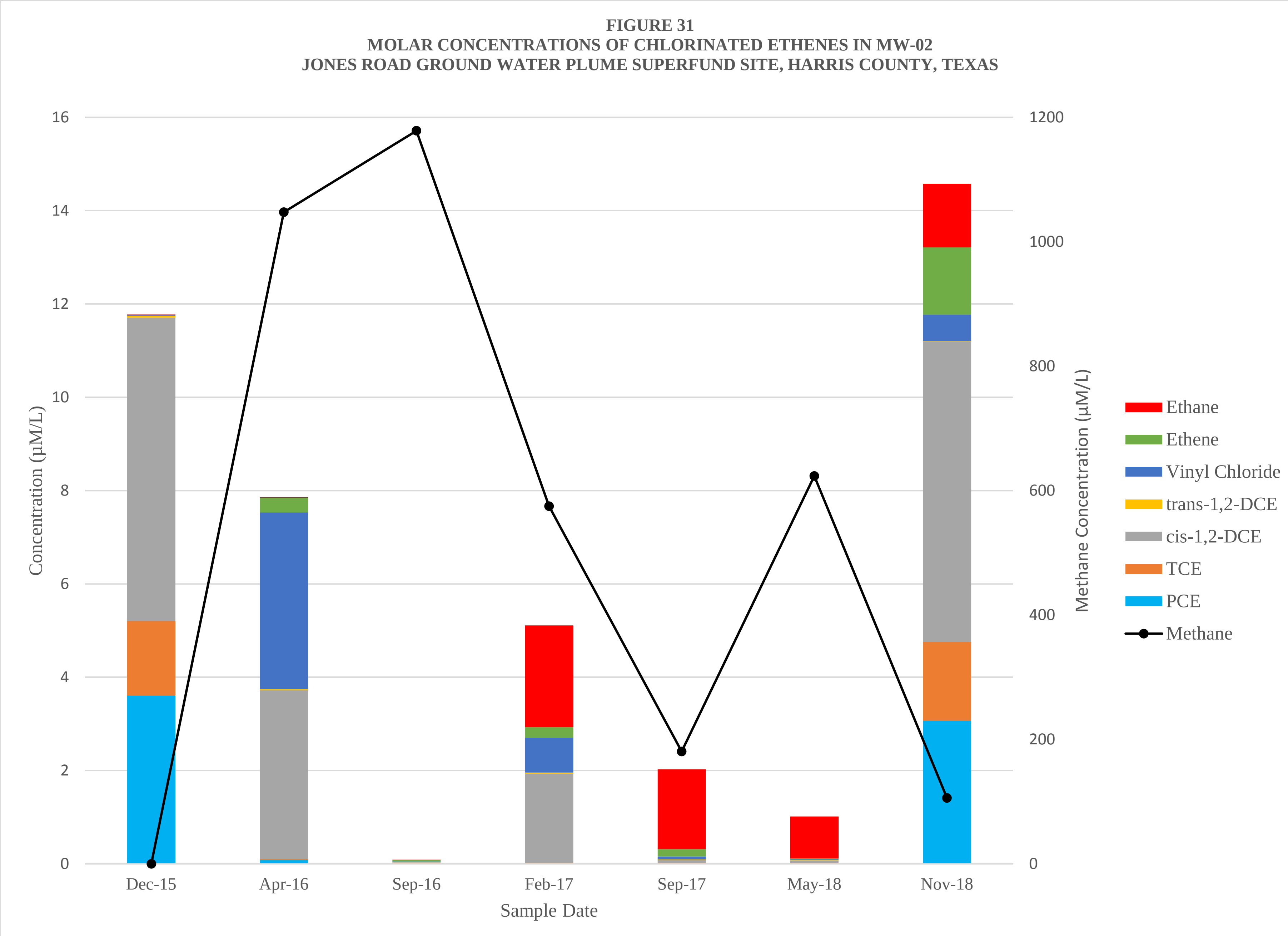


FIGURE 31
MOLAR CONCENTRATIONS OF CHLORINATED ETHENES IN MW-02
JONES ROAD GROUND WATER PLUME SUPERFUND SITE, HARRIS COUNTY, TEXAS
Concentration (µM/L)
Methane Concentration (µM/L)
Sample Date
Dec-15
Apr-16
Sep-16
Feb-17
Sep-17
May-18
Nov-18
0
2
4
6
8
10
12
14
16
0
200
400
600
800
1000
1200
Ethane
Ethene
Vinyl Chloride
trans-1,2-DCE
cis-1,2-DCE
TCE
PCE
Methane

FIGURE 32
MOLAR CONCENTRATIONS OF CHLORINATED ETHENES IN MW-03
JONES ROAD GROUND WATER PLUME SUPERFUND SITE, HARRIS COUNTY, TEXAS

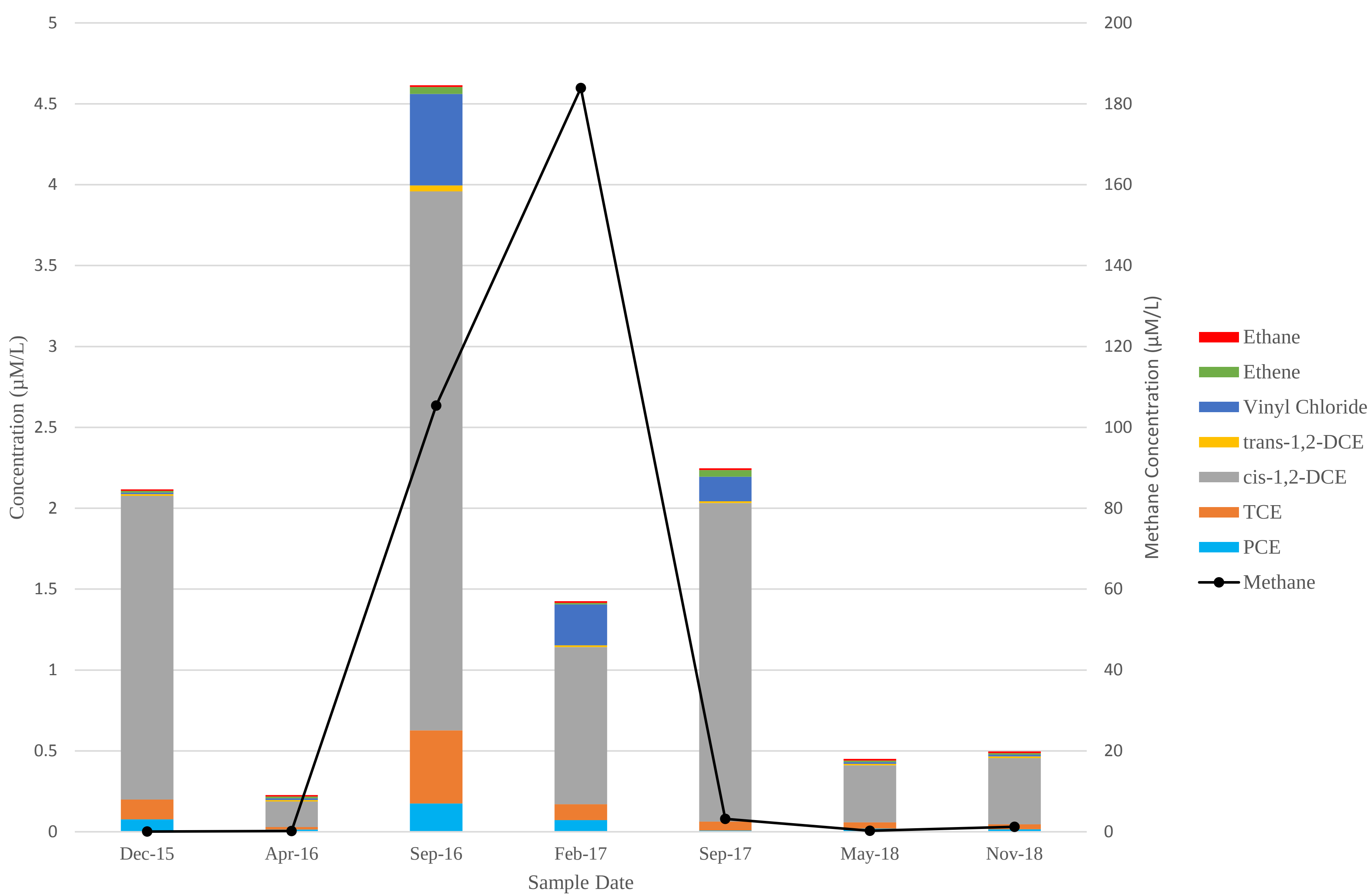
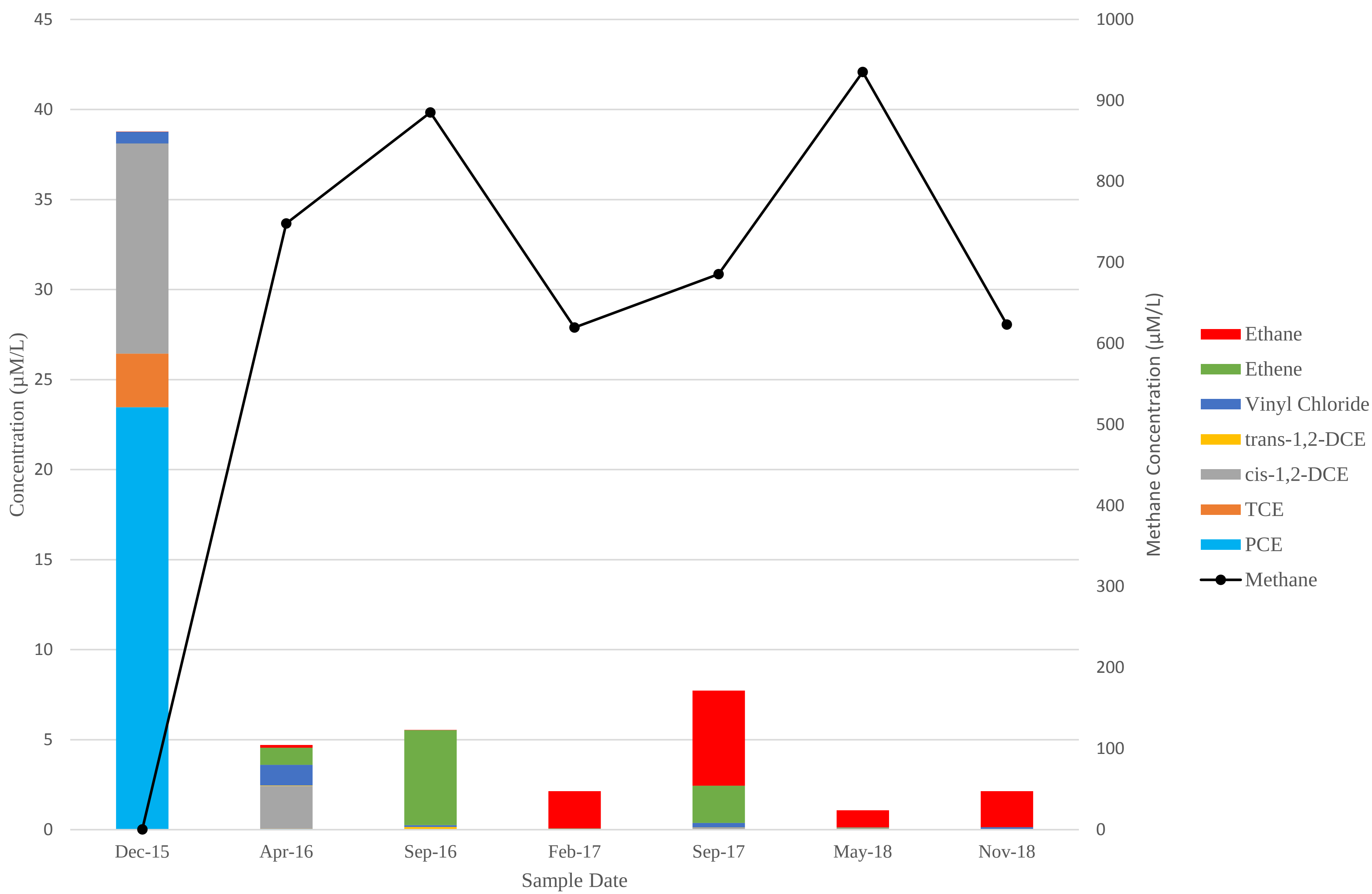


FIGURE 33
MOLAR CONCENTRATIONS OF CHLORINATED ETHENES IN MW-06
JONES ROAD GROUND WATER PLUME SUPERFUND SITE, HARRIS COUNTY, TEXAS



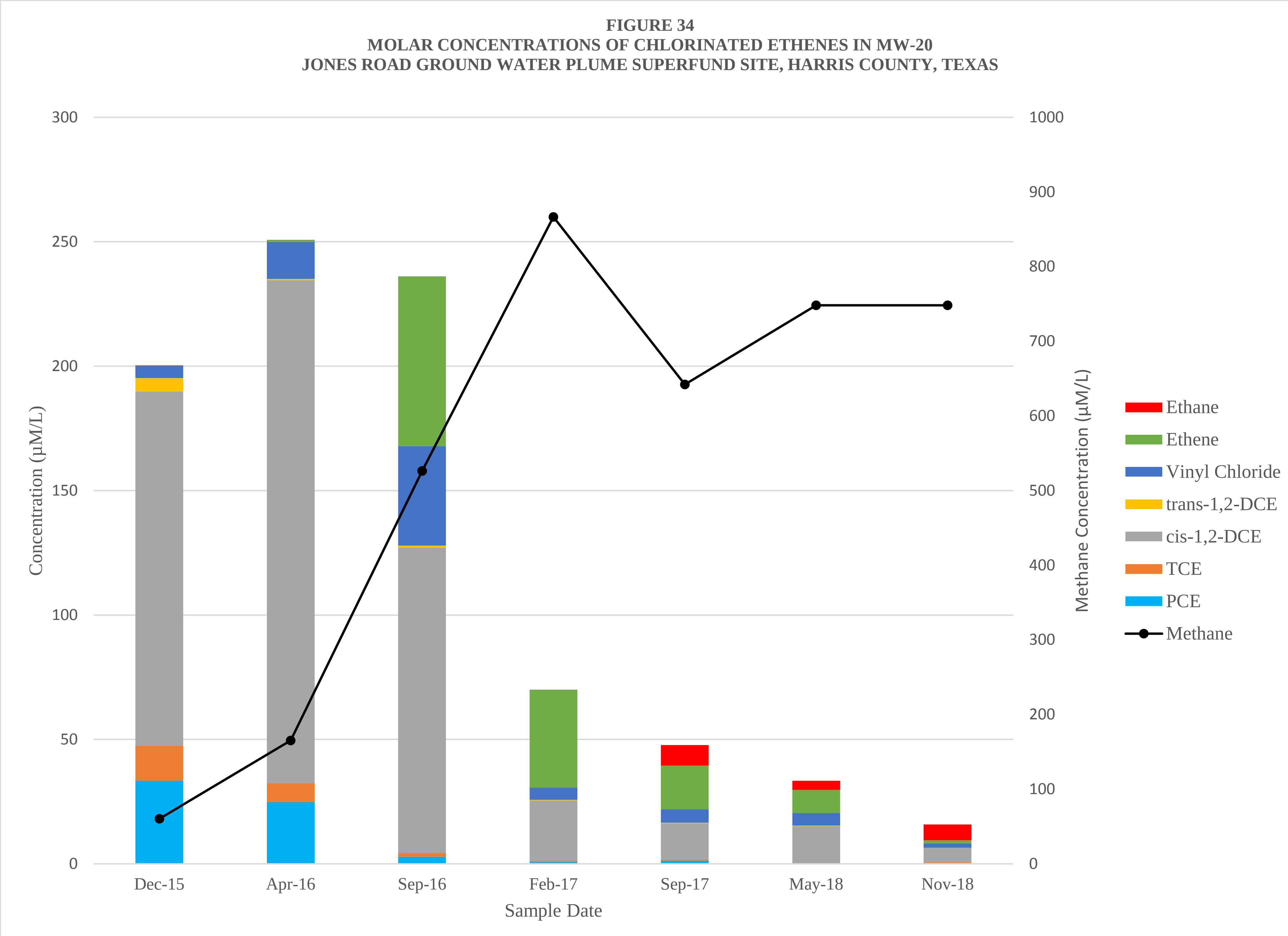


FIGURE 34
MOLAR CONCENTRATIONS OF CHLORINATED ETHENES IN MW-20
JONES ROAD GROUND WATER PLUME SUPERFUND SITE, HARRIS COUNTY, TEXAS
Concentration (µM/L)
Methane Concentration (µM/L)
Sample Date
Dec-15
Apr-16
Sep-16
Feb-17
Sep-17
May-18
Nov-18
0
50
100
150
200
250
300
0
100
200
300
400
500
600
700
800
900
1000
Ethane
Ethene
Vinyl Chloride
trans-1,2-DCE
cis-1,2-DCE
TCE
PCE
Methane

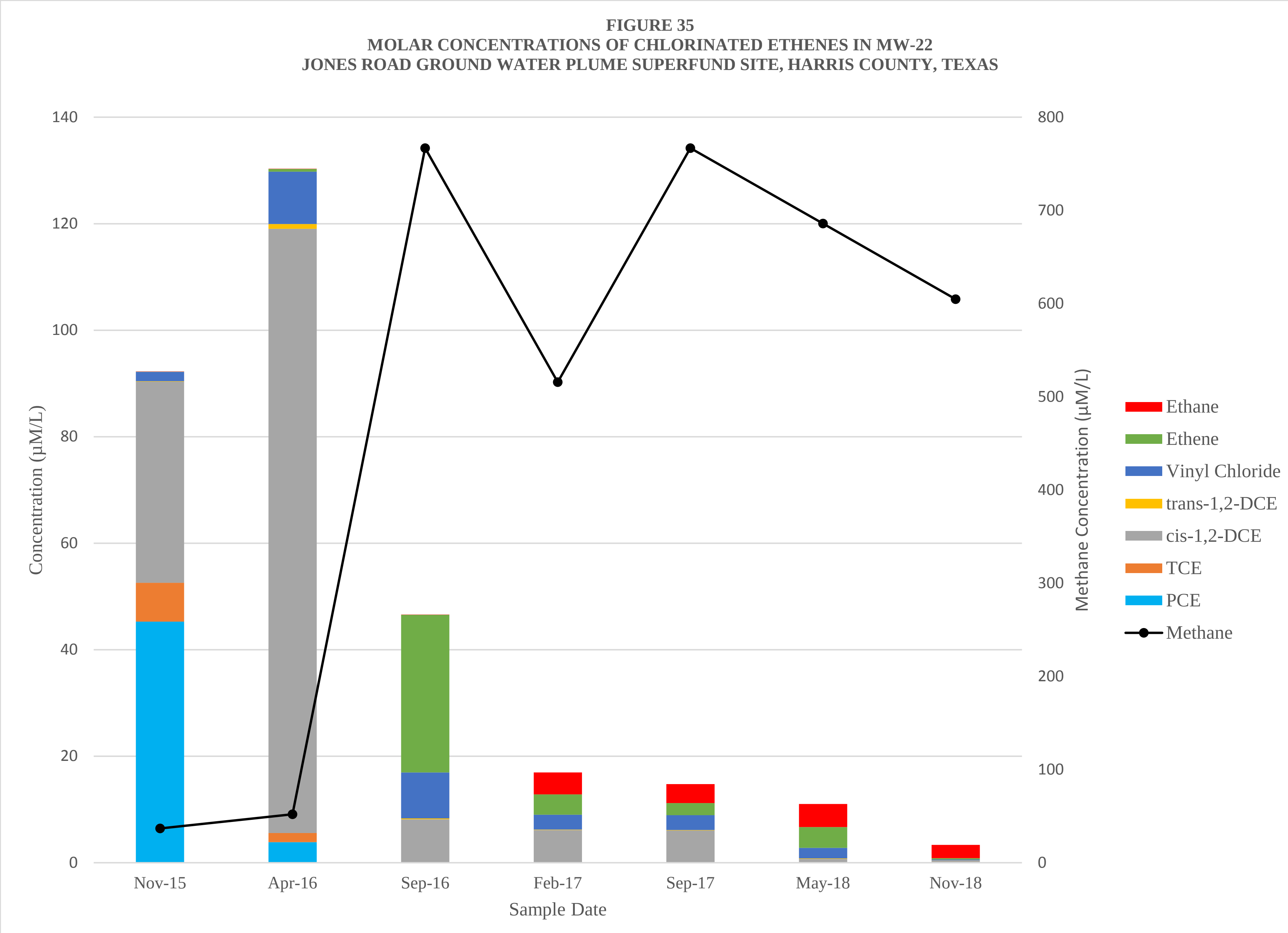


FIGURE 35
MOLAR CONCENTRATIONS OF CHLORINATED ETHENES IN MW-22
JONES ROAD GROUND WATER PLUME SUPERFUND SITE, HARRIS COUNTY, TEXAS
Concentration (µM/L)
Methane Concentration (µM/L)
Sample Date
0
20
40
60
80
100
120
140
0
100
200
300
400
500
600
700
800
Nov-15
Apr-16
Sep-16
Feb-17
Sep-17
May-18
Nov-18
Ethane
Ethene
Vinyl Chloride
trans-1,2-DCE
cis-1,2-DCE
TCE
PCE
Methane

TABLES

TABLE 1. GAUGING DATA

Well	Northing	Easting	Top of Casing Elevation (ft amsl)	Total Depth[1] (ft bgs)	Screen Interval (ft bgs)	Date Gauged	Depth To Water (ft btoc)	Ground Water Elevation (ft amsl)
MW-01	13905889.22	3050076.23	124.08	35	2.5-35	11/23/2015	25.16	98.92
						4/19/2016	21.40	102.68
						2/23/2017	22.10	101.98
						5/31/2017	25.02	99.06
MW-02	13905983.41	3050036.75	124.40	35	2.5-35	11/23/2015	23.21	101.19
						4/19/2016	19.01	105.39
						2/23/2017	19.13	105.27
						5/31/2017	23.17	101.23
MW-03	13906003.82	3050169.30	123.83	35	2.5-35	11/23/2015	22.21	101.62
						4/19/2016	17.01	106.82
						2/23/2017	17.21	106.62
						5/31/2017	22.26	101.57
MW-04	13906043.95	3050160.69	124.18	35	2-35	11/23/2015	21.39	102.79
						4/19/2016	13.10	111.08
						2/23/2017	14.61	111.08
						5/31/2017	21.98	111.08
MW-05	13906012.39	3050268.19	124.58	35	2-35	11/23/2015	22.32	102.26
						4/19/2016	16.80	107.78
						2/23/2017	17.14	107.44
						5/31/2017	22.88	101.70
MW-06	13905739.50	3050053.00	124.09	35	2-35	11/23/2015	34.01	90.08
						4/19/2016	32.27	91.82
						2/23/2017	32.80	91.29
						5/31/2017	34.83	89.26
MW-07	13905616.50	3050080.20	124.16	35	20-35	11/23/2015	28.68	95.48
						4/19/2016	27.45	96.71
						2/23/2017	27.59	96.57
						5/31/2017	29.36	94.80
MW-08	13906214.00	3050078.00	124.82	36.5	20.5-35.5	11/23/2015	20.14	104.68
						4/19/2016	15.25	109.57
						2/23/2017	15.86	108.96
						5/31/2017	20.24	104.58
MW-09	13905928.70	3049810.50	127.23	35	20-35	11/23/2015	27.28	99.95
						4/19/2016	24.40	102.83
						2/23/2017	20.41	106.82
						5/31/2017	24.87	102.36
MW-20	13905800.50	3050061.56	124.50	32	25-30	11/23/2015	27.92	96.58
						4/19/2016	26.5	98.00
						2/23/2017	25.74	98.00
						5/31/2017	27.71	98.00
MW-21	13905748.87	3050209.53	124.16	32	25.3	11/23/2015	27.61	96.55
						4/19/2016	25.38	98.78
						2/23/2017	24.96	98.78
						5/31/2017	27.46	98.78
MW-22	13905712.04	3050057.03	124.73	55	48-53	11/23/2015	49.52	75.21
						4/19/2016	48.19	76.54
						2/23/2017	45.81	78.92
						5/31/2017	48.1	76.63
MW-23	13905621.51	3050066.96	124.60	55	48-53	11/23/2015	46.67	77.93
						4/19/2016	45.31	79.29
						2/23/2017	44.57	79.29
						5/31/2017	45.01	79.29
MW-24	13905359.53	3050071.34	124.37	55	48-53	11/23/2015	20.37	104.00
						4/19/2016	16.39	107.98
						2/23/2017	18.18	107.98
						5/31/2017	21.48	107.98
MW-25	13905668.39	3049917.71	124.38	30	23-28	11/23/2015	29.41	94.97
						4/19/2016	28.15	96.23
						2/23/2017	29.45	94.93
						5/31/2017	29.43	94.95

NOTES:

[1] Total depth for wells MW-1 through MW-09 is the total depth of the borehole, which may or may not correspond to the total depth of the well. Total depth for all other wells represents total depth of the well.

amsl = Above mean sea level.
bgs = Below ground surface.
btoc = Below top of casing.
ft = Feet.

TABLE 2. GROUND WATER FIELD GEOCHEMISTRY RESULTS

Sample Location/Well ID	Sample Date	pH	DO (mg/L)	ORP (mV)	Temperature (°C)	Conductivity (µS/cm)	Turbidity (NTU)
MW-01	3-Dec-15	6.60	0.60	21.6	25.5	934	58.9
	22-Apr-16	Not Enough Water To Take Readings					
	20-Sep-16	6.28	1.4	-119.8	26.8	2,426	46.0
	23-Feb-17	6.47	0.28	-117.4	26.8	1,730	11.2
	13-Sep-17	6.51	2.90	-127.4	28.1	2,756	20.6
	24-May-18	6.59	1.05	-141.3	26.1	1,365	3.7
	7-Nov-18	6.60	0.23	-139.0	25.5	1,563	7.6
MW-02	3-Dec-15	6.74	2.63	83.7	23.7	878	104
	22-Apr-16	6.11	---	-98.2	25.2	680	53.0
	20-Sep-16	4.32	3.6	-61.0	25.7	1,557	82.6
	23-Feb-17	6.57	0.24	-99.0	24.0	1,150	6.2
	13-Sep-17	6.89	0.27	-99.9	26.0	1,218	14.4
	23-May-18	6.77	0.93	-192.7	24.7	1,032	22.3
	7-Nov-18	6.84	0.35	-13.6	23.6	1,551	19.9
MW-03	3-Dec-15	6.60	0.99	84.2	21.2	1,014	49.9
	22-Apr-16	6.65	3.82	92.1	22.2	940	62.0
	21-Sep-16	4.88	2.6	193.6	22.6	759	6.4
	22-Feb-17	6.79	0.14	-37.2	21.9	590	3.3
	12-Sep-17	6.67	0.29	69.0	25.2	1,103	32.1
	22-May-18	6.73	1.71	42.5	23.2	536	32.3
	6-Nov-18	6.64	0.60	-46.1	22.4	918	38.0
MW-04	2-Dec-15	6.74	0.67	-191.6	21.8	1,478	74.7
	21-Apr-16	6.69	0.00	-42.0	20.6	980	45.2
	22-Sep-16	4.76	1.9	230.5	21.5	1,499	6.2
	22-Feb-17	6.82	0.16	9.6	22.1	870	18.7
	12-Sep-17	6.46	0.14	-79.6	23.9	1,586	19.4
	23-May-18	6.73	11.10	-201.5	22.6	1,836	16.2
	6-Nov-18	6.68	0.19	-162.1	21.7	2,436	17.3
MW-05	2-Dec-15	6.60	0.72	-95.7	22.7	1,075	148
	21-Apr-16	7.20	2.55	168.4	22.1	376	52.3
	21-Sep-16	4.29	1.9	638.8	23.3	1,027	454
	22-Feb-17	6.69	2.3	91.9	23.2	900	9.8
	13-Sep-17	6.44	0.9	83.7	24.1	1,936	79.1
	21-May-18	6.47	1.1	-10.8	24.0	1,309	699.0
	5-Nov-18	6.53	1.82	-9.8	21.6	1,058	---
MW-06	1-Dec-15	Not Enough Water To Take Readings					
	21-Apr-16	6.11	0.33	-0.4	25.4	580	189
	21-Sep-16	Not Enough Water To Take Readings					
	21-Feb-17						
	11-Sep-17						
	22-May-18						
	6-Nov-18						
MW-07	1-Dec-15	Casing Damaged; Could Not Accommodate A Pump					
	20-Apr-16						
	21-Sep-16						
	20-Feb-17						
	11-Sep-17						
	22-May-18						
	5-Nov-18						
MW-08	2-Dec-15	7.07	0.56	-137.5	23.4	494	109
	19-Apr-16	6.71	0.01	6.2	24.0	780	4.0
	20-Sep-16	3.64	1.6	622.2	24.6	840	32.0
	21-Feb-17	6.63	0.20	156.3	23.6	850	7.7
	13-Sep-17	6.82	0.37	87.1	24.3	1,459	40.4
	24-May-18	Well was under large woodpile - Inaccessible					
	5-Nov-18	Well was under large woodpile - Inaccessible					
MW-09	2-Dec-15	6.65	1.60	143.6	22.1	712	184
	21-Apr-16	6.70	1.53	196.7	23.0	740	68.7
	22-Sep-16	3.80	2.5	599.8	24.0	1,156	66.5
	23-Feb-17	6.59	0.59	75.4	22.9	1,070	3.8
	12-Sep-17	6.66	0.53	-18.2	27.5	1,674	92.4
	24-May-18	6.59	0.60	9.0	24.1	1,042	56.0
	5-Nov-18	6.45	0.29	-92.2	22.6	1,235	---
MW-20	2-Dec-15	Not Enough Water To Take Readings					
	22-Apr-16	6.31	0.00	40.8	27.5	1,120	77.6
	22-Sep-16	5.67	1.4	-8.0	26.9	2,166	278
	21-Feb-17	6.29	0.12	-37.9	27.2	1,930	13.1
	13-Sep-17	6.34	0.17	-70.2	29.2	2,989	68.2
	24-May-18	Not Enough Water To Take Readings					
MW-21	1-Dec-15	6.52	0.80	202.1	26.2	1,154	--
	22-Apr-16	6.55	0.0	193.0	25.5	990	9.87
	22-Sep-16	6.16	1.2	426.2	25.1	1,052	11.7
	22-Feb-17	6.65	0.13	49.8	24.8	1,010	1.4
	13-Sep-17	6.39	0.19	30.1	28.6	1,837	12.3
	23-May-18	Not Enough Water To Take Readings					
	7-Nov-18	6.65	0.18	-52.60	24.76	1111.00	2.16
MW-22	30-Nov-15	6.40	0.77	139.0	24.6	1,091	--
	21-Apr-16	6.21	0.04	-14.7	25.9	1,180	158
	21-Sep-16	Bailer was used to collect sample.					
	21-Feb-17						
	12-Sep-17	6.38	3.50	-20.80	26.60	2787.00	76.71
	22-May-18	Not Enough Water To Take Readings					
MW-23	1-Dec-15	6.79	1.29	-1,860.7	23.2	634	158
	20-Apr-16	6.93	0.38	144.0	25.6	630	--
	21-Sep-16	4.67	1.9	616.8	25.3	680	182
	20-Feb-17	6.94	0.48	12.9	24.2	680	20.4
	12-Sep-17	7.04	0.70	28.5	26.0	1,194	678.0
	21-May-18	6.78	0.76	-15.8	27.7	686	95.0
	5-Nov-18	6.91	0.64	-54.5	24.8	817	---
MW-24	1-Dec-15	7.19	1.03	214.6	23.3	521	33.8
	20-Apr-16	7.04	0.20	137.9	24.3	540	79.4
	21-Sep-16	4.82	2.1	644.3	25.3	559	52.6
	21-Feb-17	7.04	0.83	131.5	25.1	570	14.3
	12-Sep-17	7.32	0.59	10.0	25.8	933	27.2
	21-May-18	7.00	0.87	-48.6	25.4	598	36.8
	7-Nov-18	7.09	0.38	-91.3	24.6	706	11.0
MW-25	NS	Not Enough Water To Take Readings					
	19-Apr-16						
	21-Sep-16						
	11-Sep-17						
	24-May-18	Not Sampled, well was dry					

NOTES:
°C = Degrees Celsius.
µS/cm = Micro-Siemens per centimeter.
mg/L = Milligrams per liter.
mV = Millivolts.
NS = Not Sampled.
NTU = Nephlometric Turbidity Units.

TABLE 3. GROUND WATER ANALYTICAL RESULTS FOR DISSOLVED METALS

Sample Location/Well ID	Sample Date	Iron (µg/L)		Manganese (µg/L)		Arsenic (µg/L)		Calcium (µg/L)		Sodium (µg/L)		Magnesium (µg/L)		Aluminum (µg/L)		Cadmium (µg/L)		Barium (µg/L)
MW-01	5-Jun-12	<25.0	U	14.2		<2.00	U	126,000		53,700		12,100		<100	U	6.4	U	874
	17-Jul-12	5,860		445		57.9		140,000		65,200		15,600		<200	U	<2.0	U	856
	25-Sep-12	12,600		860		148	J	150,000	J	50,500	J	16,000	J	<200	U	<1.0	U	1,280
	18-Dec-12	12,300		794		51.8		168,000		56,300		15,500		2320		<1.0	U	748
	6-Jun-15	98.7	J	281		2.47		140,000		63,400		14,700		5.93	J	<1.00	U	825
	3-Dec-15	1,060		286		11.6		122,000		53,800		12,300		<100	U	< 5.00	U	727
	22-Apr-16	40,900		2,200	B	129		208,000		147,000		37,500		<2.57	U	<0.114	U	47.3
	20-Sep-16	29,800		1,490		380		300,000		96,700		28,300		<100	U	< 5.00	U	922
	23-Feb-17	26,200		1,260		127		219,000		69,800		23,400		<100	U	< 5.00	U	664
	13-Sep-17	29,900		1,540		166		203,000		68,300		23,300		<100	U	< 5.00	U	754
	24-May-18	26,200		1,360		177		170,000		65,800		20,000		<100	U	< 5.00	U	707
	7-Nov-18	26,600		1,450		167		187,000		67,600		21,400		<200	U	<1.0	U	634
MW-01-DUP	20-Sep-16	28,400		1,460		363		299,000		93,400		27,700		<100	U	< 5.00	U	869
	23-Feb-17	25,400		1,310		114		229,000		70,600		24,000		<100	U	< 5.00	U	670
	13-Sep-17	28,100		1,540		150		201,000		66,900		22,700		<100	U	< 5.00	U	732
	24-May-18	27,300		1,350		183		172,000		65,900		20,300		<100	U	< 5.00	U	722
	7-Nov-18	26,000		1,410		170		183,000		66,300		21,000		<200	U	<1.00	U	631
MW-02	3-Dec-15	<25.0	U	<5.00	U	<2.00	U	96,200		82,700		10,000		<100	U	< 5.00	U	708
	22-Apr-16	8,740		1,250	B	37.0		52,300		53,400		7,420		9.38	J	<0.114	U	21.7
	20-Sep-16	19,900		2,340		41.1		162,000		119,000		15,800		<100	U	< 5.00	U	614
	23-Feb-17	8,440		2,040		34.3		99,500		136,000		13,300		<100	U	< 5.00	U	618
	13-Sep-17	3,780		767		31.0		84,500		51,000		7,680		<100	U	< 5.00	U	522
	24-May-18	6,640		1,040		40.3		112,000		103,000		12,600		<100	U	< 5.00	U	522
	7-Nov-18	1,030		247		10.3		109,000		169,000		13,300		221	U	<1.00	U	612
MW-02-DUP	3-Dec-15	<25.0	U	<5.00	U	<2.00	U	96,900		82,900		10,000		<100	U	<5.00	U	713
	22-Apr-16	7,100		1,180	B	26.2		47,800		53,900		6,890		6.13	J	<0.114	U	20.1
MW-03	3-Dec-15	140		39.0		4.40		145,000		81,700		18,000		101		<5.00	U	495
	22-Apr-16	87.2		15.0	B	13.9		133,000		60,300		15,100		39.1		0.61	J	348
	22-Sep-16	1,070		344		4.70		107,000		40,500		11,100		<100	U	< 5.00	U	244
	23-Feb-17	357		126		23.0		72,300		22,400		7,250		<100	U	< 5.00	U	145
	12-Sep-17	322		84.6		9.2		68,400		23,200		84.6		<100	U	< 5.00	U	145
	24-May-18	42.9		12.1		13.1		76,400		28,500		8,100		<100	U	< 5.00	U	212
	7-Nov-18	129	UC	16.6		6.2		124,000		49,100		12,800		27.3	J	0.16	J	264
MW-04	2-Dec-15	885		266		12.4		163,000		129,000		19,700		<100	U	<5.00	U	328
	21-Apr-16	104		135	B	29.4		130,000		82,100		13,500		4.15	J	<0.114	U	319
	22-Sep-16	1,780		969		16.7		158,000		107,000		19,100		<100	U	< 5.00	U	386
	22-Feb-17	335		194		64.2		109,000		60,200		12,800		<100	U	< 5.00	U	285
	12-Sep-17	527		246		11.2		97,300		49,700		9,270		<100	U	< 5.00	U	200
	24-May-18	799		252		5.4		201,000		144,000		30,900		<100	U	< 5.00	U	436
	6-Nov-18	1240		402		15.5		269,000		204,000		35,500		73.4	J	<1.00	U	574
MW-05	2-Dec-15	<25.0	U	19.1		<2.00	U	139,000		72,800		18,800		<100	U	<5.00	U	431
	21-Apr-16	15.0	J	7.23	B	1.76		54,400		19,900		7,250		16.2	J	<0.114	U	240
	21-Sep-16	35.1		18.7		<2.00	U	137,000		59,600		19,000		<100	U	< 5.00	U	641
	22-Feb-17	<25.0	U	<5.00	U	<1.00	U	135,000		51,100		18,500		<100	U	< 5.00	U	675
	13-Sep-17	1,480		57.5		<2.50	U	171,000		56,000		22,100		1980		< 5.00	U	776
	24-May-18	<25.0	U	14.5		<2.50	U	173,000		89,500		24,400		<100	U	< 5.00	U	752
	5-Nov-18	<100	U	<15.00	U	0.61	J	158,000		37,700		20,100		<200		<1.00	U	683
MW-06	1-Dec-15	120		12.0		<2.00	U	126,000		79,600		11,800		<100	U	<5.00	U	888
	21-Apr-16	265		260	B	10.0		79,900		37,400		7,110		12.3	J	<0.114	U	273
	21-Feb-17	5,780		1,220		21.0		130,000		74,100		12,500		318		< 5.00	U	553
	11-Sep-17	6,460		879		47.3		144,000		54,400		13,200		<100	U	< 5.00	U	641
	24-May-18	7,210		1,520		66.2		176,000		93,200		18,300		213		< 5.00	U	1020
	6-Nov-18	12,000		1,100		50.5		164,000		100,000		16,800		<200	U	<1.0	U	859
MW-07	1-Dec-15	<25.0	U	68.9		<2.00	U	126,000		18,200		10,300		<100	U	<5.00	U	1,230
	20-Apr-16	1,910		78.2		4.95		101,000	B	22,100		10,800		1,620		<0.114	U	739
	20-Feb-17	<25.0	U	53.1		<1.00	U	129,000		18,000		10,800		<100	U	< 5.00	U	1,240
	11-Sep-17	<25.0	U	27.6		<2.50	U	127,000		17,700		10,900		<100	U	< 5.00	U	1,170
	24-May-18	60		280		<2.50	U	129,000		18,800		9,990		<100	U	< 5.00	U	1,210
	6-Nov-18	<100	U	21.1		0.7	J	130,000		19,600		11,500		<200	U	<1.0	U	1,130
MW-07-DUP	1-Dec-15	<25.0	U	72.6		<2.00	U	132,000		19,200		10,800		<100	U	<5.00	U	1,290
MW-08	2-Dec-15	1,020		496		4.40		79,500		16,600		8,120		<100	U	<5.00	U	183
	19-Apr-16	121	F1	82.8		6.50		124,000	B	42,900		14,200		16.7	J	<0.114	U	814
	20-Sep-16	98.2		220		3.30		122,000		39,900		13,900		<100	U	< 5.00	U	997
	21-Feb-17	51.1		161		1.90		128,000		42,900		14,800		<100	U	< 5.00	U	1,060
	13-Sep-17	171		119		<2.50	U	122,000		39,200		13,600		<100	U	< 5.00	U	985
MW-09	2-Dec-15	1,520		40.0		<2.00	U	115,000		35,300		10,000		1,820		<5.00	U	673
	21-Apr-16	<6.09	U	1.52	J B	1.69		109,000		42,200		10,600		13.1	J	<0.114	U	596
	22-Sep-16	40.2		5.00		<2.00	U	145,000		57,900		15,300		<100	U	< 5.00	U	628
	23-Feb-17	<25.0	U	<5.00	U	<1.00	U	145,000		51,900		14,900		<100	U	< 5.00	U	685
	13-Sep-17	42.7		7.20		<2.50	U	142,000		38,900		13,400		<100	U	< 5.00	U	830
	24-May-18	50.1		5.70		<2.50	U	160,000		42,800		14,700		<100	U	< 5.00	U	911
	5-Nov-18	<100	U	<15.0	U	0.89	J	171,000		47,800		16,300		62.3	J	<1.0	U	817
MW-20	3-Jun-15	<100	U	73.90		2.19		165,000		73,600		17,500		<20.0	U	<1.00	U	1,220
	2-Dec-15	67.8		117		<2.00	U	144,000		69,600		15,200		<100	U	<5.00	U	1,070
	22-Apr-16	<6.09	U	113	B	12.7		136,000		54,600		14,300		<2.57	U	<0.114	U	1,030
	22-Sep-16	13,400		2,430		228		277,000		84,600		32,700		<100	U	< 5.00	U	1,410
	21-Feb-17	16,400		1,880		181		277,000		99,400		33,200		<100	U	< 5.00	U	1,270
	13-Sep-17	15,600		1,410		182		234,000		86,400		28,000		<100	U	< 5.00	U	1,130
	24-May-18	69,300		2,360		271		368,000		115,000		54,300		22300		< 5.00	U	2,160
	6-Nov-18	12,100		796		82.2		227,000		85,500		27,000		5,420		<1.00	U	1,140
MW-21	3-Jun-15	<100	U	828		1.35		162,000		61,900		17,700		<20.0	U	<1.00	U	1,280
	1-Dec-15	3,380		339		2.60		159,000		60,800		16,600		2,060		<5.00	U	1,290
	22-Apr-16	15.6	J	571	B	8.84		130,000		43,700		13,200		11.1	J	<0.114	U	1,070
	22-Sep-16	<25.0	U	735		10.5		132,000		49,600		14,000		<100	U	< 5.00	U	1,100
	22-Feb-17	<25.0	U	718		3.30		146,000		57,100		15,400		<100	U	< 5.00	U	1,190
	13-Sep-17	<25.0	U	892		7.70		141,000		53,000		15,200		<100	U	< 5.00	U	1,130
	24-May-18	4640		461		6.10		142,000		58,700		16,200		4430		< 5.00	U	1,040
	7-Nov-18	323	UC	905		12.10		152,000		56,700		15,600		<200	U	<1.00	U	1,030
MW-21-DUP	7-Nov-18	187	UC	818		7.20		148,000		54,800		15,300		<200	U	<1.00	U	1,050
MW-22	3-Jun-15	<100	U	40.7		0.9	J	155,000		81,200		16,200		<20.0	U	<1.00	U	1,270
	30-Nov-15	55.2		34.6		<2.00	U	137,000		75,300		13,800		<100	U	<5.00	U	1,110
	21-Apr-16	<6.09	U	166	B	5.31		147,000		75,000		16,200		<2.57	U	<0.114	U	1,160
	21-Feb-17	3,550		1880		48.2		221,000		93,000		24,100		240		< 5.00	U	1,420
	12-Sep-17	3,210		1220		35.5		202,000		84,900		21,600		<100	U	< 5.00	U	1,380
	24-May-18	3,210		1470		48.2		206,000		91,600		22,300		271		< 5.00	U	1,480
	6-Nov-18	2,860		682		24.4		154,000		60,200		15,500		499		0.065	J	996
MW-22-DUP	21-Apr-16	<6.09	U	211	B	5.36		146,000		75,800		16,300		<2.57	U	<0.114	U	1,140
	21-Feb-17	4,120		1,930		52.2		224,000		94,200		24,600		311		< 5.00	U	1,460
	12-Sep-17	3,190		1,550		48.9		203,000		84,400		22,000		<100	U	< 5.00	U	1,320
	24-May-18	3,310		1,500		48.5		213,000		94,700		22,900		230		< 5.00	U	1,530
MW-23	3-Jun-15	<100	U	18.3		0.41	J	102,000		24,800		11,200		<20.0	U	<1.00	U	642
	1-Dec-15	278		32.1		<2.00	U	103,000		22,200		10,600		317		<5.00	U	768
	20-Apr-16	15.3	J	1.22	J	3.08		80,000	B	26,600		9,750		14.5	J	<0.114	U	381
	21-Sep-16	530		34.5		<2.00	U	100,000		21,400		10,300		592		< 5.00	U	778
	20-Feb-17	<25.0	U	<5.00	U	<1.00	U	108,000		23,600		11,200		<100	U	< 5.00	U	831
	12-Sep-17	<25.0	U	<5.00	U	<2.50	U	94,400		20,200		9,930		<100	U	< 5.00	U	729
	24-May-18	780		84.5		<2.50	U	107,000		25,300		11,300		868		< 5.00	U	869
	6-Nov-18	<100	U	<15.00	U	<1.0	U	111,000		24,600		11,400		<200	U	<1.00	U	791
MW-23-DUP	21-Sep-16	694		34.6		<2.00	U	97,100		21,000		10,100		831		< 5.00	U	767
MW-24	3-Jun-15	<100	U	9.98		0.89	J	98,200		33,400		8,760		<20.0	U	<1.00	U	556
	1-Dec-15	<25.0	U	15.4		<2.00	U	24,200		32,900		4,400		<100	U	<5.00	U	188
	20-Apr-16	2,510		367		7.17		121,000	B	19,000		10,900		1,820		<0.114	U	1,080
	21-Sep-16	<25.0	U	5.80		<2.00	U	27,200		29,500		4,930		<100	U	< 5.00	U	211
	21-Feb-17	<25.0	U	<5.00	U	<1.00	U	30,900		30,100		4,370		<100	U	< 5.00	U	217
	12-Sep-17	<25.0	U	<5.00	U	<2.50	U	30,200		28,100		3,510		<100	U	< 5.00	U	177
	24-May-18	25		5.4		<2.50	U	89,000		27,000		9,690		<100	U	< 5.00	U	361
	6-Nov-18	<100	U	<15.0	U	0.62	J	101,000		26,300		10,200		<200	U	<1.0	U	331
MW-25	3-Jun-15	<100	U	6.89		2.35		53,800		47,900		4,200		<20.0	U	<1.00	U	334
	19-Apr-16	91.4		8.43		7.24		94,400	B	60,000		5,460		64.8		<0.114	U	731

NOTES:
MW-25 was dry during the pre-injection sampling event and was not sampled.
B = Compound was found in the blank and sample.
F1 = MS and/or MSD Recovery is outside acceptance limits.
J = Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
µg/L = Micrograms per liter.
NS = Not Sampled.
U = Indicates the analyte was analyzed for but not detected.

TABLE 4. GROUND WATER ANALYTICAL RESULTS FOR MONITORED NATURAL ATTENUATION PARAMETERS

Sample Location/Well ID	Sample Date	Methane (µg/L)		Nitrate Nitrite as N (mg/L)		Total Organic Carbon (mg/L)		Orthophosphate (mg/L)		Ammonia (mg/L)	
MW-01	3-Dec-15	2,350		1.36	F1	2.18		<0.0104	U	<0.0675	U
	22-Apr-16	7,430		<0.017	U	1,690		16.8	H	7.35	
	20-Sep-16	15,900		<0.019	U	113		0.194	H	0.099	J
	23-Feb-17	18,100		<0.019	U	30.6		0.0734		2.49	
	13-Sep-17	14,000		0.074	J	15.7		0.5920	F1 B	2.38	
	24-May-18	14,000		<0.040	U	8.7		0.6100		1.70	
	7-Nov-18	12,000		0.041	J	7.2		1.30		3.00	
MW-01-DUP	20-Sep-16	17,400		<0.019	U	113		0.121	H	0.132	
	23-Feb-17	16,100		<0.019	U	30.1		0.325		2.65	
	13-Sep-17	14,200		0.072	J	15.7		1.130	B	2.44	
	24-May-18	14,000		<0.040	U	8.8		0.200		1.80	
	7-Nov-18	12,000		0.046	J	8.0		1.20		0.54	
MW-02	3-Dec-15	2.50		8.12		1.36		0.025	J	<0.0675	U
	22-Apr-16	16,800		<0.017	U	89.9		5.32	H	0.517	
	20-Sep-16	18,900		<0.019	U	20.6		0.373	H	1.98	
	23-Feb-17	9,220		<0.019	U	9.31		1.95		1.34	
	13-Sep-17	2,900		0.027	J	3.79		1.35	B	0.60	
	23-May-18	10,000		0.400		4.80		1.40		0.62	
	7-Nov-18	1,700		15.800		4.70		0.40		0.380	
MW-02-DUP	3-Dec-15	1.88		6.47		1.41		0.032	J	<0.0675	U
	22-Apr-16	11,000		<0.017	U	94.0		4.01	H	0.555	
MW-03	3-Dec-15	0.894	J	10.1		5.19		0.281		<0.0675	U
	22-Apr-16	3.27		2.42		14.1		0.314	H	<0.0675	U
	22-Sep-16	1,690		2.28		7.08		0.415		0.341	
	22-Feb-17	2,950		<0.019	U	22.5		0.737		0.0878	J
	12-Sep-17	51.0		0.21		9.0		1.740		0.3040	
	22-May-18	4.0	J	0.19		16.0		0.550		<0.050	U
	6-Nov-18	20.0		0.800		10.30		0.51		0.130	
MW-04	2-Dec-15	283		0.0301	J	19.3		0.781		1.00	
	21-Apr-16	114		<0.017	U	20.6		0.501		<0.0675	U
	22-Sep-16	2,740		<0.019	U	15.4		0.566		1.140	
	22-Feb-17	6.59		<0.019	U	18.3		0.376		0.158	
	12-Sep-17	785.00		0.057	J	17.5		1.070		0.422	
	23-May-18	97.00		0.130		11.8		0.290		0.660	
	6-Nov-18	24.00		<0.040	U	15.5		0.31		0.082	J
MW-05	2-Dec-15	36.3		5.48		1.98		<0.0104	U	<0.0675	U
	21-Apr-16	1.36		1.21		4.61		0.064		<0.0675	U
	21-Sep-16	66.2		0.927		2.44		0.010	J	<0.022	U
	22-Feb-17	8.10		1.58		2.57		0.009	J	<0.022	U
	13-Sep-17	42.30		1.70		2.15		0.006	J B	<0.022	U
	21-May-18	3.30	J	11.30		2.10		0.034	J	<0.050	U
	5-Nov-18	<3.00	U	0.97		2.60		0.013		<0.050	U
MW-06	1-Dec-15	5.73		1.88		4.17		0.105	J	<0.0675	U
	21-Apr-16	12,000		<0.017	U	31.1		0.347		<0.0675	U
	21-Sep-16	14,200		<0.019	U	79.0		0.620		0.134	
	22-Feb-17	9,940		<0.019	U	31.2		0.313		0.572	
	11-Sep-17	11,000		<0.019	U	7.1		0.233	B	0.450	
	22-May-18	15,000		<0.040	U	8.5		1.200		1.200	
	6-Nov-18	10,000		<0.040	U	10.20		0.660		1.100	
MW-07	1-Dec-15	1.05		0.371		0.936	J	0.023	J	<0.0675	U
	20-Apr-16	<0.357	U	1.93		0.630	J	<0.0519	U	<0.0675	U
	21-Sep-16	<0.218	U	0.563		0.656	J	<0.006	U	<0.022	U
	20-Feb-17	0.749	J	0.672		1.05		0.0190	J	0.0252	J
	11-Sep-17	3.180	J	0.762	F1	0.58	J	0.0524	B	<0.022	U
	21-May-18	7.500		0.560		1.50		0.0490	J	<0.050	U
	5-Nov-18	<3.00	U	0.300		0.99	J	<0.003	U	0.052	J
MW-07-DUP	1-Dec-15	1.11		0.382		0.796	J	0.0250	J	<0.0675	U
MW-08	2-Dec-15	710		<0.017	U F1	35.8		0.253		0.294	
	19-Apr-16	276		0.781		19.2	F1	0.0273	J	<0.0675	U
	20-Sep-16	114		0.772		1.57		0.0256	J H	<0.022	U
	21-Feb-17	13.7		0.896		1.73		0.0241	J	<0.022	U F1
	13-Sep-17	3.53	J	0.344		1.40		0.0316	J B	<0.022	U
MW-09	2-Dec-15	<0.357	U	1.57		0.759	J	<0.0104	U	<0.0675	U
	21-Apr-16	0.493	J	1.67		2.57		0.0238	J	<0.0675	U
	22-Sep-16	0.485	J	1.49		2.36		<0.006	U	<0.022	U
	23-Feb-17	<0.218	U	2.64		2.30		0.0099	J	<0.022	U
	12-Sep-17	0.333	J	2.86		1.89		<0.187	U	<0.022	U
	24-May-18	7.300		2.30		1.90		<0.03	U	<0.05	U
	5-Nov-18	<3.00	U	2.20		2.20		0.0085	J	<0.05	U
MW-20	2-Dec-15	969		0.235		5.09		<0.0519	U	<0.0675	U
	22-Apr-16	2,650		<0.017	U	5.29		0.015	J H	<0.0675	U
	22-Sep-16	8,440		<0.019	U F1	76.0		<0.006	U	<0.022	U
	21-Feb-17	13,900		<0.019	U	34.7		<0.006	U	<0.022	U
	13-Sep-17	10,300		0.032	J F1	6.2		<0.006	U	0.0593	J
	24-May-18	12,000		<0.040	U	125.0		<0.060	U	<0.050	U
	6-Nov-18	12,000		<0.040	U	6.70		<0.015	U	0.0810	J
MW-21	1-Dec-15	4.16		16.2		1.52		0.450	J	<0.0675	U
	22-Apr-16	18.4		2.74		1.28		0.0255	J H	<0.0675	U
	22-Sep-16	1,600		2.20		1.12		0.0175	J	<0.022	U
	22-Feb-17	1,160		1.13		1.07		0.0097	J	<0.022	U
	13-Sep-17	283		0.46		0.98	J	0.0204	J B	<0.022	U
	23-May-18	160		1.90		1.50		<0.15	U	<0.50	U
	7-Nov-18	22		1.20		1.60		0.0120		0.1100	
MW-21-DUP	7-Nov-18	18		1.20		1.60		0.0120		0.0680	J
MW-22	30-Nov-15	590		1.15	F1	2.35		0.300	J	<0.0675	U
	21-Apr-16	834		<0.017	U	2.88		<0.0104	U	<0.0675	U
	21-Sep-16	12,300		<0.019	U	15.2		<0.006	U	0.0319	J
	21-Feb-17	8,270		<0.019	U	3.46		<0.006	U	<0.022	U
	12-Sep-17	12,300		0.024	J	3.01		<0.187	U	<0.022	U
	22-May-18	11,000		<0.040	U	17.20		0.0710	J	<0.050	U
	6-Nov-18	9,700		<0.040	U	5.80		0.1400		0.0720	J
MW-22-DUP	21-Apr-16	998		0.018	J	2.93		<0.0104	U	<0.0675	U
	21-Feb-17	7,690		0.078	J	3.30		<0.006	U	0.0346	J F1
	12-Sep-17	13,000		0.019	J	3.03		<0.187	U	<0.022	U
	22-May-18	10,000		<0.040	U	5.00		0.0630	J	<0.050	U
MW-23	1-Dec-15	<0.357	U	1.01		1.09		<0.0104	U	<0.0675	U
	20-Apr-16	<0.357	U	0.485		0.559	J	<0.0519	U	<0.0675	U
	21-Sep-16	0.272	J	1.24		0.391	J	<0.006	U	0.0440	J
	20-Feb-17	<0.218	U	1.15		0.912	J	<0.006	U	<0.022	U
	12-Sep-17	<0.218	U	1.09		0.616	J	<0.187	U	<0.022	U
	21-May-18	<0.20	U	1.50		0.790	J	<0.15	U	<0.050	U
	5-Nov-18	<3.00	U	1.60		0.830	J	<0.003	U	0.0570	J
MW-23-DUP	21-Sep-16	<0.218	U	1.19		0.360	J	<0.006	U	<0.022	U
MW-24	1-Dec-15	<0.357	U	0.468	F1 F2	1.55		<0.0104	U	<0.0675	U
	20-Apr-16	0.754	J	0.670		0.829	J	<0.0519	U	<0.0675	U
	21-Sep-16	0.312	J	0.543		0.486	J	<0.006	U	<0.022	U
	21-Feb-17	0.346	J	1.02		0.884	J	<0.006	U	<0.022	U
	12-Sep-17	<0.218	U	1.21		0.857	J	<0.187	U F1	<0.022	U
	22-May-18	<3.0	U	0.65		1.100		0.0300	J	<0.050	U
	6-Nov-18	<3.00	U	0.65		0.540	J	0.0210		<0.050	U
MW-25	19-Apr-16	<0.357	U	0.309		2.50		0.0465	J	<0.0675	U

NOTES:
F1 = MS and/or MSD Recovery is outside acceptance limits.
F2 = MS/MSD RPD exceeds control limits.
H = Sample was prepped or analyzed beyond the specified holding time.
J = Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
MDL = Method Detection Limit
MS/MSD = Matrix Spike/Matrix Spike Duplicate
µg/L = Micrograms per liter.
mg/L = Milligrams per liter.
MW-25 was dry during the pre-injection sampling event and was not sampled.
NS = Not Sampled.
RL = Reporting Limit.
U = Indicates the analyte was analyzed for but not detected.

TABLE 5. GROUND WATER ANALYTICAL RESULTS FOR VOLATILE ORGANIC COMPOUNDS

Sample Location/Well ID	Sample Date	PCE			TCE			cis-1,2-DCE			trans-1,2-DCE			Vinyl Chloride			Ethene			Ethane		
		(µg/L)		(µM/L)	(µg/L)		(µM/L)	(µg/L)		(µM/L)	(µg/L)		(µM/L)	(µg/L)		(µM/L)	(µg/L)		(µM/L)	(µg/L)		(µM/L)
MW-01	5-Jun-12	17,100		103.12	980		7.46	1,260		13.0	7.60		0.078	117		1.87	0.823	J	0.029	0.800	J	0.027
	17-Jul-12	944	J	5.69	101		0.769	6,050		62.4	21.1		0.218	84.2		1.35	0.317	J	0.011	0.580	J	0.019
	25-Sep-12	53.0		0.320	13.0		0.099	16,000		165	16.0	J	0.165	190		3.04	<28.0	U	---	<32.0	U	---
	18-Dec-12	75.0		0.452	17.0		0.129	7,800		80.5	8.90		0.092	93.0		1.49	12.5		0.446	1.08		---
	6-Jun-15	29,800		179.70	2,510		19.1	11,500		119	<2,500	U	---	794	J	12.70	NA		---	NA		---
	3-Dec-15	14,500		87.4	1,990		15.1	6,640		68.5	36.3		0.378	420		6.72	3.53		0.126	2.41		0.080
	22-Apr-16	61.3		0.370	20.2		0.154	12,300		127	27.4		0.286	386		6.18	64.0		2.28	3.00		0.100
	20-Sep-16	<2.00	U	---	<2.00	U	---	6.40		0.066	4.90		0.051	5.00		0.080	111		3.96	1.72	U	0.057
	23-Feb-17	<1.00	U	---	<1.00	U	---	11.4		0.118	9.90		0.103	1.20		0.019	96.0		3.42	187		6.22
	13-Sep-17	<1.00	U	---	<1.00	U	---	24.5		0.253	4.60		0.048	78.1		1.250	87.9		3.13	589		19.59
	24-May-18	<1.00	U	---	<1.00	U	---	471.0		4.858	4.60		0.048	276.00		4.416	140.0		4.99	1300		43.23
	7-Nov-18	3.2		0.019	3.8		0.029	1,230.0		12.687	7.40		0.077	311.00		4.976	150.0		5.35	1,500		49.88
MW-01-DUP	20-Sep-16	<2.00	U	---	<2.00	U	---	3.80		0.039	4.90		0.051	3.80		0.061	124		4.42	1.72	U	---
	23-Feb-17	<1.00	U	---	<1.00	U	---	10.5		0.108	10.0		0.104	1.30		0.021	93.2		3.32	171		5.69
	13-Sep-17	<1.00	U	---	<1.00	U	---	21.5		0.222	4.6		0.048	72.5		1.160	87.1		3.11	599		19.92
	24-May-18	<1.00	U	---	1.9		0.014	462.0		4.765	4.9		0.051	263.00		4.208	140.0		4.99	1300		43.23
	7-Nov-18	2.8		0.017	1.8			1,190.0		12.274	5.60		0.058	309.00		4.944	150.0		5.35	1,500		49.9
MW-02	3-Dec-15	599		3.61	210		1.60	630		6.50	3.40		0.035	<2.00	U	---	<0.324	U	---	<0.303	U	---
	22-Apr-16	13.0		0.078	3.08		0.023	351		3.62	1.88		0.020	237		3.79	8.82		0.314	<0.303	U	---
	20-Sep-16	<2.00	U	---	<2.00	U	---	<2.00	U	---	<2.00	U	---	<2.00	U	---	0.796	U	0.028	1.15	U	---
	23-Feb-17	<1.00	U	---	<1.00	U	---	186		1.92	1.80		0.019	46.9		0.750	6.13	P	0.219	65.7		2.18
	13-Sep-17	<1.00	U	---	<1.00	U	---	6		0.07	<1.00	U	---	3.8		0.061	4.52	J	0.161	51.4		1.71
	23-May-18	1.8		0.011	1.20		0.009	5		0.05	<1.00	U	---	<2.00	U	---	0.74	J	0.026	27.0		0.90
	7-Nov-18	508.0		3.063	222.00			625.00			1.1			35.00			41.00		1.462	41.00		1.36
MW-02-DUP	3-Dec-15	900		5.43	254		1.93	545		5.62	3.40		0.035	<2.00	U	---	<0.324	U	---	<0.303	U	---
	22-Apr-16	12.8		0.077	3.01		0.023	337		3.48	1.78		0.019	270		4.32	6.37		0.227	3.75		0.125
MW-03	3-Dec-15	12.7		0.077	16.2		0.123	182		1.88	<2.00	U	---	<2.00	U	---	<0.324	U	---	<0.303	U	---
	22-Apr-16	2.22		0.013	2.03		0.015	15.3		0.158	<0.192	U	---	0.663	J	0.011	<0.324	U	---	<0.303	U	---
	22-Sep-16	28.9		0.174	59.5		0.453	323		3.33	3.50		0.036	35.4		0.566	1.19	J	0.042	<0.573	U	---
	22-Feb-17	11.9		0.072	13.0		0.099	94.2		0.97	<1.00	U	---	15.8		0.253	<0.398	U	---	<0.573	U	---
	12-Sep-17	1.2		0.007	7.3		0.056	191		1.97	<1.00	U	---	9.5		0.152	1.17	J	0.042	<0.573	U	---
	22-May-18	3.4		0.021	4.9		0.037	34.2		0.35	<1.00	U	---	<2.00	U	---	<0.20	U	---	<0.20	U	---
	6-Nov-18	2.50		0.015	4.00		0.030	39.8		0.41	<1.00			<1.00		---	<1.00	U	---	<1.00	U	---
MW-04	2-Dec-15	<2.00	U	---	<2.00	U	---	<2.00	U	---	<2.00	U	---	<2.00	U	---	<0.324	U	---	<0.303	U	---
	21-Apr-16	<0.333	U	---	<0.138	U	---	<0.157	U	---	<0.192	U	---	<0.248	U	---	<0.324	U	---	<0.303	U	---
	22-Sep-16	<2.00	U	---	<2.00	U	---	2.60		0.027	<2.00	U	---	<2.00	U	---	<0.398	U	---	<0.573	U	---
	22-Feb-17	<1.00	U	---	<1.00	U	---	<1.00	U	---	<1.00	U	---	<1.00	U	---	<0.398	U	---	<0.573	U	---
	12-Sep-17	<1.00	U	---	<1.00	U	---	<1.00	U	---	<1.00	U	---	<1.00	U	---	<0.398	U	---	<0.573	U	---
	23-May-18	<1.00	U	---	<1.00	U	---	<1.00	U	---	<1.00	U	---	<1.00	U	---	<0.20	U	---	<0.20	U	---
	6-Nov-18	<1.00	U	---	<1.00	U	---	<1.00	U	---	<1.00	U	---	<1.00	U	---	<1.00	U	---	<1.00	U	---
MW-05	2-Dec-15	<2.00	U	---	<2.00	U	---	<2.00	U	---	<2.00	U	---	<2.00	U	---	<0.324	U	---	<0.303	U	---
	21-Apr-16	<0.333	U	---	<0.138	U	---	<0.157	U	---	<0.192	U	---	<0.248	U	---	<0.324	U	---	<0.303	U	---
	21-Sep-16	<2.00	U	---	<2.00	U	---	<2.00	U	---	<2.00	U	---	<2.00	U	---	<0.398	U	---	<0.573	U	---
	22-Feb-17	<1.00	U	---	<1.00	U	---	<1.00	U	---	<1.00	U	---	<1.00	U	---	<0.398	U	---	<0.573	U	---
	13-Sep-17	<1.00	U	---	<1.00	U	---	<1.00	U	---	<1.00	U	---	<1.00	U	---	<0.398	U	---	<0.573	U	---
	21-May-18	<1.00	U	---	<1.00	U	---	<1.00	U	---	<1.00	U	---	<1.00	U	---	<0.20	U	---	<0.20	U	---
	5-Nov-18	<1.00	U	---	<1.00	U	---	<1.00	U	---	<1.00	U	---	<1.00	U	---	<1.00	U	---	<1.00	U	---
MW-06	1-Dec-15	3,890		23.5	393		2.99	1,130		11.7	<5.00	U	---	39.9		0.638	<0.324	U	---	<0.303	U	---
	21-Apr-16	9.07		0.055	1.49		0.011	229	F1	2.36	2.41		0.025	71.5		1.14	26.7		0.952	4.63		0.154
	21-Sep-16	<2.00	U	---	<2.00	U	---	<2.00	U	---	12.0		0.125	6.20		0.10	148		5.28	<1.15	U	---
	21-Feb-17	<1.00	U	---	<1.00	U	---	2.10		0.02	<1.00	U	---	<1.00	U	---	<0.398	U	---	62.3		2.07
	11-Sep-17	<1.00	U	---	<1.00	U	---	9.00		0.09	1.6		0.017	15.5		0.25	58		2.06	159.0		5.29
	22-May-18	<1.00	U	---	<1.00	U	---	3.30		0.03	1.2		0.013	2.30		0.04	0.44	J	0.02	29.0		0.96
	6-Nov-18	<1.00	U	---	<1.00	U	---	1.60		0.02	1.10		0.011	5.30		0.08	<1.00	U	---	60		2.00
MW-07	1-Dec-15	<2.00	U	---	<2.00	U	---	<2.00	U	---	<2.00	U	---	<2.00	U	---	<0.324	U	---	<0.303	U	---
	20-Apr-16	0.740	J	0.004	<0.138	U	---	<0.157	U	---	<0.192	U	---	<0.248	U	---	<0.324	U	---	<0.303	U	---
	21-Sep-16	<2.00	U	---	<2.00	U	---	<2.00	U	---	<2.00	U	---	<2.00	U	---	<0.398	U	---	<0.573	U	---
	20-Feb-17	<1.00	U	---	<1.00	U	---	<1.00	U	---	<1.00	U	---	<1.00	U	---	<0.398	U	---	<0.573	U	---
	11-Sep-17	<1.00	U	---	<1.00	U	---	<1.00	U	---	<1.00	U	---	<1.00	U	---	<0.398	U	---	<0.573	U	---
	21-May-18	<1.00	U	---	<1.00	U	---	<1.00	U	---	<1.00	U	---	<1.00	U	---	<0.20	U	---	<0.20	U	---
	5-Nov-18	<1.00	U	---	<1.00	U	---	<1.00	U	---	<1.00	U	---	<1.00	U	---	<1.00	U		<1.00	U	
MW-07-DUP	1-Dec-15	<2.00	U	---	<2.00	U	---	<2.00	U	---	<2.00	U	---	<2.00	U	---	<0.324	U	---	<0.303	U	---
MW-08	2-Dec-15	3.50		0.021	<2.00	U	---	<2.00	U	---	<2.00	U	---	<2.00	U	---	0.377	J	0.013	<0.303	U	---
	19-Apr-16	0.413	J	0.002	<0.138	U	---	0.393	J	0.004	0.192	U*	0.002	<0.248	U	---	<0.324	U F1 F2	---	<0.303	U F1 F2	---
	20-Sep-16	<2.00	U	---	<2.00	U	---	<2.00	U	---	<2.00	U	---	<2.00	U	---	<0.398	U	---	<0.573	U F1	---
	21-Feb-17	<1.00	U	---	<1.00	U	---	<1.00	U	---	<1.00	U	---	<1.00	U	---	<0.398	U	---	<0.573	U F1	---
	13-Sep-17	<1.00	U	---	<1.00	U	---	<1.00	U	---	<1.00	U	---	<1.00	U	---	<0.398	U	---	<0.573	U	---
MW-09	2-Dec-15	8.20		0.049	<2.00	U	---	7.10		0.073	<2.00	U	---	<2.00	U	---	<0.324	U	---	<0.303	U	---
	21-Apr-16	0.411	J	0.002	<0.138	U	---	<0.157	U	---	<0.192	U	---	<0.248	U	---	<0.324	U	---	<0.303	U	---
	22-Sep-16	<2.00	U	---	<2.00	U	---	<2.00	U	---	<2.00	U	---	<2.00	U	---	<0.398	U	---	<0.573	U	---
	23-Feb-17	<1.00	U	---	<1.00	U	---	<1.00	U	---	<1.00	U	---	<1.00	U	---	<0.398	U	---	<0.573	U	---
	12-Sep-17	<1.00	U	---	<1.00	U	---	<1.00	U	---	<1.00	U	---	<1.00	U	---	<0.398	U	---	<0.573	U	---
	24-May-18	<1.00	U	---	<1.00	U	---	<1.00	U	---	<1.00	U	---	<1.00	U	---	<0.20	U	---	1.200	J	0.04
	5-Nov-18	<1.00	U	---	<1.00	U	---	<1.00	U	---	<1.00	U	---	<1.00	U	---	<1.00	U		<1.00	U	
MW-20	3-Jun-15	2,380		14.35	586		4.46	13,000		134	<500	U	---	191	J	3.06	NA		---	NA		---
	2-Dec-15	5,550		33.5	1,850		14.1	13,800		142	511	J	5.33	313		5.01	1.70	J	0.061	1.22	J	0.041
	22-Apr-16	4,140		25.0	977		7.44	19,600	J	202	45.8	J	0.477	932		14.9	19.9		0.709	2.09		0.070
	22-Sep-16	475		2.86	198		1.51	11,900		123	72.5		0.756	2,500		40.0	1,910		68.1	10.3	U	---
	21-Feb-17	135		0.814	60.2		0.458	2,350		24.2	26.2		0.273	304		4.86	1,100		39.2	<1.72	U	---
	13-Sep-17	228		1.375	61.4		0.467	1,400		14.4	25.3		0.264	340		5.44	490		17.5	248		8.247
	23-May-18	7		0.045	8.9		0.068	1,460		15.1	18.7		0.195	313		5.01	260		9.3	110		3.658
	6-Nov-18	21		0.127	71.3		0.543	550		5.7	8.1		0.084	117		1.87	35		1.2	190		6.319
MW-21	3-Jun-15	6.38		0.038	0.433	J	0.003	1.18	J	0.012	<5.00	U	---	<2.00	U	---	NA		---	NA		---
	1-Dec-15	2.20		0.013	<2.00	U	---	<2.00	U	---	<2.00	U	---	<2.00	U	---	<0.324	U	---	<0.303	U	---
	22-Apr-16	0.477	J	0.003	<0.138	U	---	<0.157	U	---	<0.192	U	---	<0.248	U	---	<0.324	U	---	<0.303	U	---
	22-Sep-16	<2.00	U	---	<2.00	U	---	<2.00	U	---	<2.00	U	---	<2.00	U	---	<0.398	U	---	<0.573	U	---
	22-Feb-17	<1.00	U	---	<1.00	U	---	<1.00	U	---	<1.00	U	---	<1.00	U	---	<0.398	U	---	<0.573	U	---
	13-Sep-17	<1.00	U	---	<1.00	U	---	<1.00	U	---	<1.00	U	---	<1.00	U	---	<0.398	U	---	<0.573	U	---
	23-May-18	<1.00	U	---	<1.00	U	---	<1.00	U	---	<1.00	U	---	<1.00	U	---	0.220	J	0.01	0.260	J	0.01
	7-Nov-18	<1.00	U	---	<1.00	U	---	<1.00	U	---	<1.00	U	---	<1.00	U	---	<1.00	U	---	<1.00	U	---
MW-21-DUP	7-Nov-18	<1.00	U	---	<1.00	U	---	<1.00	U	---	<1.00	U	---	<1.00	U	---	<1.00	U	---	<1.00	U	---
MW-22	3-Jun-15	10,100		60.91	934	J	7.11	4,230		43.6	<1,000	U	---	182	J	2.91	NA		---	NA		---
	30-Nov-15	7,510		45.3	957		7.28	3,660		37.8	11.1		0.116	110		1.76	<0.324	U	---	<0.303	U	---
	21-Apr-16	639		3.85	225		1.71	11,000		113	88.2		0.919	615		9.84	14.0		0.499	1.08	J	0.036
	21-Sep-16	<2.00	U	---	<2.00	U	---	789		8.14	17.0		0.177	540		8.64	831		29.63	<1.15	U	---
	21-Feb-17	<1.00	U	---	1.50		0.011	596		6.15	8.50		0.089	172		2.75	107		3.81	125		4.16
	12-Sep-17	<1.00	U	---	6.50		0.049	584		6.02	8.3		0.087	173		2.77	64		2.27	107		3.56
	22-May-18	<1.00	U	---	1.00		0.008	69.9		0.72	9.7		0.101	122		1.95	110		3.92	130		4.32
	6-Nov-18	11		0.06	2.70		0.021	29.3		0.30	3.90		0.041	10		0.16	7		0.26	75		2.49
MW-22-DUP	21-Apr-16	1,680		10.13	336		2.56	12,500	E	129	77.8		0.811	675		10.8	17.6		0.627	1.82	J	0.061
	21-Feb-17	<1.00	U	---	1.80		0.014	648		6.68	10.2		0.106	165		2.64	101		3.60	113		3.76
	12-Sep-17	<1.00	U	---	6.40		0.049	523		5.39	8.0		0.083	170		2.72	71		2.51	132		4.39
	22-May-18	<1.00	U	---	1.00		0.008	74.2		0.77	10.30		0.107	128		2.05	100.0		3.57	120		3.99
MW-23	3-Jun-15	1.00	J	0.006	<5.00	U	---	<5.00	U	---	<5.00	U	---	<2.00	U	---	NA		---	NA		---
	1-Dec-15	<2.00	U	---	<2.00	U	---	<2.00	U	---	<2.00	U	---	<2.00	U	---	<0.324	U	---	<0.303	U	---
	20-Apr-16	<0.333	U	---	<0.138	U	---	<0.157	U	---	<0.192	U	---	<0.248	U	---	<0.324	U	---	<0.303	U	---
	21-Sep-16	2.10		0.013	<2.00	U	---	<2.00	U	---	<2.00	U	---	<2.00	U	---	<0.398	U	---	<0.573	U	---
	20-Feb-17	2.70		0.016	<1.00	U	---	<1.00	U	---	<1.00	U	---	<1.00	U	---	<0.398	U		<0.573	U	---
	12-Sep-17	<1.00	U	---	<1.00	U	---	<1.00	U	---	<1.00	U	---	<1.00	U	---	<0.398	U	---	<0.573	U	---
	21-May-18	1.80		0.011	<1.00	U	---	<1.00	U	---	<1.00	U	---	<1.00	U	---	<0.20	U	---	<0.20	U	---
	5-Nov-18	1.40			<1.00	U	---	<1.00	U	---	<1.00	U	---	<1.00	U		<1.00	U	---	<1.00	U	---
MW-23-DUP	21-Sep-16	<2.00	U	---	<2.00	U	---	<2.00	U	---	<2.00	U	---	<2.00	U	---	<0.398	U	---	<0.573	U	---
MW-24	3-Jun-15	<2.00	U	---	<5.00	U	---	<5.00	U	---	<5.00	U	---	<2.00	U	---	NA		---	NA		---
	1-Dec-15	<2.00	U	---	<2.00	U	---	<2.00	U	---	<2.00	U	---	<2.00	U	---	1.19	J	0.042	<0.303	U	---
	20-Apr-16	<0.333	U	---	<0.138	U	---	<0.157	U	---	<0.192	U	---	<0.248	U	---	<0.324	U	---	<0.303	U	---
	21-Sep-16	<2.00	U	---	<2.00	U	---	<2.00	U	---	<2.00	U	---	<2.00	U	---	0.443	J	0.016	<0.573	U	---
	21-Feb-17	<1.00	U	---	<1.00	U	---	<1.00	U	---	<1.00	U	---	<1.00	U	---	<0.398	U	---	<0.573	U	---
	12-Sep-17	<1.00	U	---	<1.00	U	---	<1.00	U	---	<1.00	U	---	<1.00	U	---	<0.398	U	---	<0.573	U	---
	22-May-18	<1.00	U	---	<1.00	U	---	<1.00	U	---	<1.00	U	---	<1.00	U	---	<0.20	U	---	<0.20	U	---
	6-Nov-18	<1.00	U	---	<1.00	U	---	<1.00	U	---	<1.00	U	---	<1.00	U	---	<1.00	U	---	<1.00	U	---
MW-25	3-Jun-15	<2.00	U	---	<5.00	U	---	<5.00	U	---	<5.00	U	---	<2.00	U	---	NA		---	NA		---
	19-Apr-16	<0.333	U	---	<0.138	U	---	<0.157	U	---	<0.192	U	---	<0.248	U	---	0.324	U	0.012	<0.303	U	---

NOTES:
* = Exceeds acceptable limits.
DCE = Dichloroethene.
E = Result exceeded calibration range.
F1 = MS and/or MSD Recovery is outside acceptance limits.
F2 = MS/MSD RPD exceeds control limits.
J = Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
P = The %RPD between the primary and confirmation column/detector is >40%. The higher value has been reported.
MDL = Method Detection Limit.
µg/L = Micrograms per liter.
µM/L = Micromoles per liter.
MW-25 was dry during the pre-injection sampling event and was not sampled.
MS/MSD = Matrix Spike/Matrix Spike Duplicate.
NS = Not Sampled.
PCE = Tetrachloroethene.
RPD = Relative Percent Difference.
RL = Reporting Limit.
TCE = Trichloroethene.
U = Indicates the analyte was analyzed for but not detected.

TABLE 6A. - SUMMARY OF INJECTION MECHANICS (Initial Injection)

Well Identification	Date of Injection	Start Time	End Time	Batch Number	Volume of EHC®-L mixture (gal)	Volume of Water (gal)	Total Volume Injected (gal)	Injection Rate (gpm)	Injection Pressure (psi)
P-01	1/29/2016	15:18	16:35		100	400	505	7	70
P-02	1/30/2016	10:04	11:16		100	400	505	7	70
P-03	1/29/2016	13:50	15:07		100	400	505	7	70
P-04	1/29/2016	16:05	17:17		100	400	505	7	80
P-05	1/29/2016	13:13	14:25		100	400	505	7	80
P-06	1/29/2016	8:30	8:33		4	16	20	7	70
		8:40	8:44		10	40	50	5	50
P-07	1/29/2016	9:53	12:14		186	745	940	7	75
P-08	1/29/2016	13:20	14:15		65	259	327	7	75
		14:15	14:54		35	141	178	5	65
P-09	1/29/2016	8:20	9:31		100	400	505	7	65
P-10	1/29/2016	13:45	14:15		37	148	187	7	80
		14:15	15:26		63	252	318	5	75
P-11	1/29/2016	14:35	15:56		100	400	505	7	75
P-12	1/29/2016	15:45	16:58		100	400	505	7	75
P-13	1/30/2016	9:25	10:43		100	400	505	7	75
P-14	1/28/2016	8:45	9:59	A	100	400	505	7	95
P-15	1/28/2016	10:10	11:30		100	400	505	7	75
P-16	1/28/2016	13:00	13:02		0	0	0	0	0
		16:20	17:38		100	400	505	7	60
P-17	1/28/2016	8:45	10:03		100	400	505	7	65
P-18	1/28/2016	12:40	13:52		100	400	505	7	75
P-19	1/29/2016	8:15	9:28		100	400	505	7	70
P-20	1/28/2016	10:08	11:23		100	400	505.0	7	60
P-21	1/30/2016	9:22	10:35		100	400	505	7	95
P-22	1/30/2016	10:06	11:18		100	400	505	7	70
P-23	1/28/2016	9:36	10:03		39	156	197	7	70
		10:03	11:13		61	244	308	5	65
P-24	1/28/2016	16:10	17:28		100	400	505	7	70
P-25	1/28/2016	13:41	14:50		100	400	505	7	65
P-26	1/29/2016	9:00	10:21		100	400	505	7	65
P-27	1/29/2016	8:25	9:35		100	400	505	7	70
P-28	1/28/2016	9:27	10:43		100	400	505	7	80
P-29	1/27/2016	15:30	17:45		100	850	955	7	65
P-30	1/30/2016	12:45	15:15		100	850	955	7	75
P-31	1/27/2016	14:50	17:06		100	850	955	7	60
P-32	1/30/2016	13:15	15:42		100	850	955	7	80
P-33	1/27/2016	10:10	12:15		100	850	955	7	60
P-34	1/27/2016	10:40	12:53	B	100	850	955	7	70
P-35	1/30/2016	12:43	15:11		100	850	955	7	90
P-36	1/30/2016	13:09	15:35		100	850	955	7	70
P-37	1/31/2016	8:35	10:58		100	850	955	7	80
P-38	1/31/2016	8:00	10:25		100	850	955	7	70
P-39	1/26/2016	15:45	18:17		100	850	955	5.5	80
P-40	2/1/2016	8:05	10:31		100	850	955	7	70
P-41	1/26/2016	15:29	17:45		100	850	955	7	50
P-42	1/31/2016	12:15	14:28		100	850	955	7	65
P-43	1/26/2016	15:00	17:22		100	850	955	7	10
P-44	2/1/2016	12:50	15:16		163	850	1033	7	70
		15:30	17:30		--	--	840	7	70
P-45	2/1/2016	12:45	15:11		163	850	1033	7	65
		15:30	17:00		--	--	630	7	65
P-46	2/1/2016	8:15	10:42		100	850	955	7	70
P-47	1/31/2016	11:50	14:09		100	850	955	7	70
P-48	1/27/2016	14:00	16:22		100	850	955	7	50
P-49	2/1/2016	8:10	10:37		100	850	955	7	75
P-50	2/1/2016	12:40	15:06		163	850	1033	7	60
		15:30	17:00		--	--	630	7	60
P-51	1/31/2016	12:17	14:30		100	850	955	7	65
P-52	1/27/2016	9:35	11:52	B	100	850	955	7	65
P-53	1/26/2016	10:40	11:30		31	267	300	5	50
		11:30	13:12		69	583	655	6.5	55
P-54	2/1/2016	8:00	10:26		100	850	955	7	65
P-55	1/26/2016	9:30	11:30		70	596	670	5	55
		11:30	12:18		30	254	285	7	70
P-56	1/31/2016	8:30	10:53		100	850	955	7	70
P-57	1/26/2016	14:36	17:16		100	850	955	7	60
P-58	1/31/2016	11:45	14:06		100	850	955	7	75
P-59	1/27/2016	13:53	16:15		100	850	955	7	80
P-60	1/27/2016	9:30	11:47		100	850	955	7	80
P-61	1/26/2016	11:00	11:30		16	134	150	5	55
		11:30	13:37		84	716	805	6.5	60
P-62	1/31/2016	7:57	10:22		100	850	955	7	70
P-63	1/26/2016	9:40	11:30		66	561	630	5	55
		11:30	12:24		34	289	325	7	65

NOTES:
gal = Gallons.
gpm = Gallons per minute.
psi = Pounds per square inch.

TABLE 6B. - SUMMARY OF INJECTION MECHANICS (Hot Spot Treatment)

Well Identification	Date of Injection	Start Time	End Time	EHC®-L mixture (lbs)	Volume of Water (gal)	Total Volume Injected (gal)	Injection Rate (gpm)	Injection Pressure (psi)
IP-01	3/27/2018	8:09	11:30	37.50	679	755	9.13	75
IP-02	3/27/2018	8:10	11:20	37.50	679	754	9.8	70
IP-03	3/27/2018	8:11	12:47	37.50	679	754	6.45	75
IP-04	3/27/2018	8:11	12:55	37.50	679	754	6.01	92
IP-05	3/27/2018	10:08	15:48	37.50	302	377	1.78	160
IP-06	3/27/2018	10:08	11:47	37.50	302	378	6.35	60
P-07	3/27/2018	10:08	11:10	37.50	302	377	8.5	50
P-08	3/27/2018	11:30	13:30	37.50	302	377	0.96	100
P-09	3/27/2018	12:12	13:48	37.50	302	377	3.4	105
P-10	3/27/2018	14:00	14:41	37.50	302	377	8.45	70

NOTES:
gal = Gallons.
gpm = Gallons per minute.
psi = Pounds per square inch.

TABLE 7. FIELD MEASUREMENT INDICATORS FOR REDUCTIVE DECHLORINATION

Sample Location/Well ID	Sample Date	pH	Dissolved Oxygen	ORP	Temperature	Methane	Nitrate Nitrite as N	Total Organic Carbon
Favorable for RDC:		5 < pH < 9	< 0.5 mg/L	< -100 mV	> 20 °C	< 0.5 µg/L	< 1 mg/L	> 20 mg/L
MW-01	3-Dec-15	↑	↗	↗	↑	↓	↓	↓
	22-Apr-16	---	---	---	---	↓	↑	↑
	20-Sep-16	↑	↓	↑	↑	↓	↑	↑
	23-Feb-17	↑	↑	↑	↑	↓	↑	↑
	13-Sep-17	↑	↓	↑	↑	↓	↑	↓
	24-May-18	↑	↓	↑	↑	↓	↑	↓
	7-Nov-18	↑	↑	↑	↑	↓	↑	↓
MW-01-DUP	20-Sep-16	---	---	---	---	↓	↑	↑
	23-Feb-17	---	---	---	---	↓	↑	↑
	13-Sep-17	---	---	---	---	↓	↑	↓
	24-May-18	---	---	---	---	↓	↑	↓
	7-Nov-18	↑	↓	↓	↓	↓	↑	↓
MW-02	3-Dec-15	↑	↓	↓	↑	↓	↓	↓
	22-Apr-16	↑	---	↗	↑	↓	↑	↑
	20-Sep-16	↓	↓	↗	↑	↓	↑	↑
	23-Feb-17	↑	↑	↗	↑	↓	↑	↓
	13-Sep-17	↑	↑	↗	↑	↓	↑	↓
	23-May-18	↑	↗	↑	↑	↓	↑	↓
	7-Nov-18	↑	↑	↗	↑	↓	↓	↓
MW-02-DUP	3-Dec-15	---	---	---	---	↓	↓	↓
	22-Apr-16	---	---	---	---	↓	↑	↑
	23-May-18	---	---	---	---	↓	↑	↑
MW-03	3-Dec-15	↑	↗	↓	↑	↓	↓	↓
	22-Apr-16	↑	↓	↓	↑	↓	↓	↓
	21-Sep-16	↓	↓	↓	↑	↓	↓	↓
	22-Feb-17	↑	↑	↗	↑	↓	↑	↑
	12-Sep-17	↑	↑	↓	↑	↓	↑	↓
	22-May-18	↑	↓	↗	↑	↓	↑	↓
	6-Nov-18	↑	↗	↗	↑	↓	↑	↓
MW-04	2-Dec-15	↑	↗	↑	↑	↓	↑	↓
	21-Apr-16	↑	↑	↗	↑	↓	↑	↑
	22-Sep-16	↓	↓	↓	↑	↓	↑	↓
	22-Feb-17	↑	↑	↗	↑	↓	↑	↓
	12-Sep-17	↑	↑	↗	↑	↓	↑	↓
	23-May-18	↑	↓	↑	↑	↓	↑	↓
	6-Nov-18	↑	↑	↑	↑	↓	↑	↓
MW-05	2-Dec-15	↑	↗	↗	↑	↓	↓	↓
	21-Apr-16	↑	↑	↗	↑	↓	↑	↑
	21-Sep-16	↓	↓	↓	↑	↓	↑	↓
	22-Feb-17	↑	↓	↓	↑	↓	↓	↓
	13-Sep-17	↑	↗	↓	↑	↓	↓	↓
	21-May-18	↑	↓	↗	↑	↓	↓	↓
	5-Nov-18	↑	↓	↗	↑	↓	↑	↓
MW-06	1-Dec-15	---	---	---	---	↓	↓	↓
	21-Apr-16	↑	↑	↗	↑	↓	↑	↑
	21-Sep-16	---	---	---	---	↓	↑	↑
	21-Feb-17	---	---	---	---	↓	↑	↑
	11-Sep-17	---	---	---	---	↓	↑	↓
	22-May-18	---	---	---	---	↓	↑	↓
	6-Nov-18	---	---	---	---	↓	↑	↓
MW-07	1-Dec-15	---	---	---	---	↓	↑	↓
	20-Apr-16	---	---	---	---	↑	↓	↓
	21-Sep-16	---	---	---	---	↑	↑	↓
	20-Feb-17	---	---	---	---	↓	↑	↓
	11-Sep-17	---	---	---	---	↓	↑	↓
	22-May-18	---	---	---	---	↓	↑	↓
	5-Nov-18	---	---	---	---	---	↑	↓
MW-07-DUP	1-Dec-15	---	---	---	---	↓	↑	↓
MW-08	2-Dec-15	↑	↗	↑	↑	↓	↑	↑
	19-Apr-16	↑	↑	↗	↑	↓	↑	↓
	20-Sep-16	↓	↓	↓	↑	↓	↑	↓
	21-Feb-17	↑	↑	↓	↑	↓	↑	↓
	13-Sep-17	↑	↑	↓	↑	↓	↑	↓
	24-May-18	---	---	---	---	↓	↑	↓
MW-09	2-Dec-15	↑	↓	↓	↑	↑	↓	↓
	21-Apr-16	↑	↓	↓	↑	↑	↓	↓
	22-Sep-16	↓	↓	↓	↑	↑	↓	↓
	23-Feb-17	↑	↗	↓	↑	↑	↓	↓
	12-Sep-17	↑	↗	↗	↑	↑	↓	↓
	24-May-18	↑	↗	↗	↑	↓	↓	↓
	5-Nov-18	↑	↑	↗	↑	↓	↓	↓
MW-20	2-Dec-15	---	---	---	---	↓	↑	↓
	22-Apr-16	↑	↑	↗	↑	↓	↑	↓
	22-Sep-16	↑	↓	↗	↑	↓	↑	↑
	21-Feb-17	↑	↑	↗	↑	↓	↑	↑
	12-Sep-17	↑	↑	↗	↑	↓	↑	↓
	24-May-18	---	---	---	---	↓	↑	↑
	6-Nov-18	---	---	---	---	↓	↑	↓
MW-21	1-Dec-15	↑	↗	↓	↑	↓	↓	↓
	22-Apr-16	↑	↑	↓	↑	↓	↓	↓
	22-Sep-16	↑	↓	↓	↑	↓	↓	↓
	22-Feb-17	↑	↑	↗	↑	↓	↓	↓
	13-Sep-17	↑	↑	↗	↑	↓	↑	↓
	23-May-18	---	---	---	---	↓	↓	↓
	7-Nov-18	↑	↑	↗	↑	↓	↓	↓
MW-22	30-Nov-15	↑	↗	↓	↑	↓	↓	↓
	21-Apr-16	↑	↑	↗	↑	↓	↑	↓
	21-Sep-16	---	---	---	---	↓	↑	↓
	21-Feb-17	---	---	---	---	↓	↑	↓
	12-Sep-17	↑	↓	↗	↑	↓	↑	↓
	22-May-18	---	---	---	---	↓	↑	↓
	6-Nov-18	---	---	---	---	↓	↑	↓
MW-22-DUP	21-Apr-16	---	---	---	---	↓	↑	↓
	21-Feb-17	---	---	---	---	↓	↑	↓
	12-Sep-17	---	---	---	---	↓	↑	↓
	22-May-18	---	---	---	---	↓	↑	↓
MW-23	1-Dec-15	↑	↓	↑	↑	↑	↓	↓
	20-Apr-16	↑	↑	↓	↑	↑	↑	↓
	21-Sep-16	↓	↓	↓	↑	↑	↓	↓
	20-Feb-17	↑	↑	↗	↑	↑	↓	↓
	12-Sep-17	↑	↗	↗	↑	↑	↓	↓
	21-May-18	↑	↗	↗	↑	↑	↓	↓
	5-Nov-18	↑	↗	↗	↑	↓	↓	↓
MW-24	1-Dec-15	↑	↓	↓	↑	↑	↑	↓
	20-Apr-16	↑	↑	↓	↑	↓	↑	↓
	21-Sep-16	↓	↓	↓	↑	↑	↑	↓
	21-Feb-17	↑	↗	↓	↑	↑	↓	↓
	12-Sep-17	↑	↗	↗	↑	↑	↓	↓
	21-May-18	↑	↗	↗	↑	↓	↑	↓
	6-Nov-18	↑	↑	↗	↑	↓	↑	↓
MW-25	19-Apr-16	---	---	---	---	↑	↑	↓

NOTES:
↑ = Favorable for RDC.
↓ = Not Favorable for RDC.
↗ = Moderately Favorable for RDC (DO: 0.5 to 1.0, ORP: -100 to 50).
°C = Degrees Celsius.
µS/cm = Microseimens per centimeter.
µg/L = Micrograms per liter.
mg/L = Milligrams per liter.
mV = Millivolts.
ORP = Oxidation Reduction Potential.
RDC = Reductive Dechlorination.

ATTACHMENT A

EHC-L® MANUFACTURER'S INFORMATION

EHC® Liquid Amendment

Introduction

EHC® Liquid amendment is a cold-water soluble formulation specially designed to be emplaced via existing wells and/or hydraulic injection networks for the treatment of a wide range of groundwater contaminants. EHC Liquid is delivered as two components that are mixed together on site. The first component, a 25% liquid emulsion of food-grade lecithin, is provided in 55-USG drums containing 50 USG of emulsion. The second component (powdered mix) is a food-grade organo-iron compound. The two components are proportioned so that 24.5 lbs of powdered mix is required for each 50 USG of liquid portion. This document provides standard operating procedures for preparation of diluted EHC Liquid for injection.

Packaging

Part 1
Liquid emulsion delivered in 55-USG drums, filled with 50 USG / 420 lbs per drum (190 L / 190 Kg)

Part 2
Water soluble powder with the organo-iron compound in 24.5 lb bags (11.1 Kg)

EHC Liquid Injection Volumes and Dilutions

Depending on the application method, between 10% and 100% of the effective porosity is normally targeted during EHC Liquid injection, with a higher percent pore fill normally targeted during low-flow injections into wells and injection networks. This is in contrast to applications via direct push technology where normally around 10 to 15% of effective porosity is targeted. To facilitate the desired injection volume, the components are diluted in the field. Table 1 shows examples of mixing recipes for a 55-USG drum of liquid component in US and metric.

Table 1: EHC Liquid dilutions and corresponding concentration

Dilution:	3-fold	5-fold	10-fold	25-fold
Volume of emulsion per drum (USG)	50			
Mass dry components (lbs)	24.5			
Volume water (USG)	100	200	450	1200
Resulting total volume (USG)	150	250	500	1250
Resulting EHC Liquid concentration (wt%)	10.5%	6.3%	3.2%	1.3%

Dilution:	3-fold	5-fold	10-fold	25-fold
Volume EHC Liquid emulsion per drum (L)	190			
Mass dry components (Kg)	11.1			
Volume water (L)	380	760	1710	4560
Resulting total volume (L)	570	950	1900	4750
Resulting EHC Liquid concentration (wt%)	10.5%	6.3%	3.2%	1.3%

General Mixing Procedures

Proportioning can be varied to accommodate mixing tank size. The general mixing procedure is:

1. Fill mixing tank with required amount of dilution water per the treatment design.
2. Transfer EHC Liquid portion Part 1 to mixing tank. Note that this material is pre-emulsified, has a viscosity of about 3,000 – 4,000 cPs and will require an appropriate pump for transfer from the drum. Alternatively, the emulsion may be transferred in pails by hand. A paddle mixer and/or recirculation pump is sufficient for mixing.
3. Add in powdered mix Part 2 and continue mixing. Ensure no solids remain on bottom of tank.

   If other additives are used (e.g., pH buffers), they may be added at this time.
4. Mixing time depends on equipment used (typically 5-10 min). Material is to be mixed until uniform.

Health and Safety

EHC Liquid is safe when handled properly in accordance with instructions for use, the advisory below and the MSDS. The EHC Liquid MSDS is posted on our web site at: www.environmental.fmc.com/resource-center

When working with EHC Liquid, the use of standard personal protective equipment, including safety glasses, chemically resistant boots and nitrile gloves is recommended. Dust mask may be required when in close contact with the EHC Liquid powder component (Part 2) under certain conditions. Additional safety equipment may be required for site operations.

Document 03-01-ESD-13

ATTACHMENT B

LABORATORY REPORTS
(on compact disc only)

APPENDIX C

FIELD FORMS

Jones Road Ground Water Plume Superfund Site, Houston, Harris County, Texas

Sheet 1 of 1
Date: 04/21/16

Ground Water Sampling Data Sheet

Well ID: MW-05 Sample ID: Sample Time: 1055

Casing diameter/type: 2" PVC
Screened interval(s): 25.50 - 35.50
Total depth: 35.50
Initial depth to water (w/o pump): 16.32
Final depth to water (w/o pump): 16.60
Measuring point: North side of casing

Well location: Behind Shopping center
Sampling personnel: DJ + AB
Sampling method: Low-flow micropurge
Water level indicator: Heron
Water quality meter: YSI Pro Plus
Pump depth setting: 30

Weather: Rain / Overcast

Pump type/model: Monsoon SS

5 min	Δ < 10%	Δ < 10%			Δ < 0.1 pH		Δ < 0.3 ft	< 1L/min		< 0.5 L/min	Parameter Stabilization Limits (3 consecutive readings)
Time	Temp (°C)	Conductivity (mS/cm) or (µS/cm)	DO (%)	DO (mg/L)	pH	ORP (mV)	Water Level (feet btoc)	Flow Rate (L/min) or (mL/min)	Turbidity (NTU)	Purge Volume (L) or (mL)	Additional Comments
0933	22.1	0.392	44.9	3.87	7.35	146.6	16.68	350	653N		- water mixed
0936	22.1	0.383	34.6	3.03	7.09	143.6	16.97	500	787 AO		- slight draw down
0939	22.1	0.375	32.2	2.79	7.10	143.2	16.98	400	45		
0942	22.2	0.373	30.3	2.61	7.11	143.2	16.77	200	41		
0945											
			- Suspended	- RAIN							
1044	21.8	0.366	26.6	2.37	7.44	177.6	16.88	400	105		
1047	21.7	0.368	28.6	2.49	7.33	174.7	16.79	150	93.8		
1050	21.8	0.369	28.9	2.53	7.23	171.9	16.89	350	69.3		
1053	22.1	0.376	27.1	2.55	7.20	168.4	16.90	200	52.3		

≈ 0.75 gal Purged

Recorded By: DJ

Jones Road Ground Water Plume Superfund Site, Houston, Harris County, Texas

Sheet 1 of 1
Date: 04/19/16

Ground Water Sampling Data Sheet

Well ID: MW-08 Sample ID: Sample Time: 1500

Casing diameter/type: 2" PVC
Screened interval(s): 10-35'
Total depth: 33.58
Initial depth to water (w/o pump): 15.25
Final depth to water (w/o pump): 15.32
Measuring point: North side of casing

Well location: Wood lot
Sampling personnel: DT & AB
Sampling method: Low-flow micropurge
Water level indicator: Heron
Water quality meter: YSI Pro Plus
Pump depth setting: 32'

Weather: Overcast humid,

Pump type/model: Monsoon SS 2"

5 min	Δ < 10%	Δ < 10%			Δ < 0.1 pH		Δ < 0.3 ft	< 1L/min		< 0.5 L/min	Parameter Stabilization Limits (3 consecutive readings)
Time	Temp (°C)	Conductivity (mS/cm) or (µS/cm)	DO (%)	DO (mg/L)	pH	ORP (mV)	Water Level (feet btoc)	Flow Rate (L/min) or (mL/min)	Turbidity (NTU)	Purge Volume (L) or (mL)	Additional Comments
1444	24.3	0.79	10.6	0.84	6.91	132.9	15.30	400	7160AO		water turbid due to
1447	23.8	0.78	1.8	0.15	6.71	31.5	15.39	300	948		surface completion being
1450	23.6	0.78	1.0	0.08	6.69	16.1	15.30	200	658		destroyed. Well is under
1453	25.2	0.80	0.4	0.03	6.70	12.7	15.35	600	620		13" wood debris, no pad
1456	24.0	0.78	0.01	0.01	6.71	6.2	15.41	300	4.0		

≈ 1.0 gal purged

Recorded By: DT

Jones Road Ground Water Plume Superfund Site, Houston, Harris County, Texas

Sheet 1 of 1
Date: 04/20/16

Ground Water Sampling Data Sheet

Well ID: MW-24 Sample ID: Sample Time: 1205

Casing diameter/type: 2" PVC
Well location: O'Reilly Lot
Weather: Rain, 76°F
Screened interval(s): 30-35'
Sampling personnel: DT + AB
Total depth: 55.0
Sampling method: Low-flow micropurge
Initial depth to water (w/o pump): 16.41
Water level indicator: Heron
Final depth to water (w/o pump): 20.86
Water quality meter: YSI Pro Plus
Measuring point: North side of casing
Pump depth setting: 52
Pump type/model: Monsoon 2" SS

5 min	Δ < 10%	Δ < 10%			Δ < 0.1 pH		Δ < 0.3 ft	< 1L/min		< 0.5 L/min	Parameter Stabilization Limits (3 consecutive readings)
Time	Temp (°C)	Conductivity (mS/cm) or (µS/cm)	DO (%)	DO (mg/L)	pH	ORP (mV)	Water Level (feet btoc)	Flow Rate (L/min) or (mL/min)	Turbidity (NTU)	Purge Volume (L) or (mL)	Additional Comments
1149 23.7	23.7	0.259	29.2	2.4	9.45	142.2	16.45	150	~~162~~ 52.3		9.93 Cal on turbidity
1152	24.4	0.51	4.4	3.9	7.51	157.8	17.46	200	131		- slight drawdown
1155	24.4	0.53	2.9	2.9	7.11	152.4	18.19	180	78		- slow recharge, slight
1158	23.8	0.53	2.4	0.21	7.06	146.8	18.48	350	11		draw down
1201	24.4	0.54	2.5	0.21	7.04	143.3	19.66	200	92.8		
1204	24.3	0.54	2.5	0.20	7.04	137.9	20.23	200	75.4		

~0.75 gal Purge

Recorded By: DT

11/25/2015

Ground Water Sampling Data Sheet

Well ID: MW-23 Sample ID: Sample Time: 1420

Casing diameter/type: 2" PVC
Screened interval(s): 50-54.49
Total depth: 54.49
Initial depth to water (w/o pump): 45.18
Final depth to water (w/o pump): 45.54
Measuring point: North side of casing

Well location: BFE lot
Sampling personnel: DT + SB
Sampling method: Low-flow micropurge
Water level indicator: Heron
Water quality meter: YSI Pro+
Pump depth setting: 52

Weather: Rain/clouds
Pump type/model: Monsoon SS

Time	Temp (°C)	Conductivity (mS/cm) or (µS/cm)	DO (%)	DO (mg/L)	pH	ORP (mV)	Water Level (feet btoc)	Flow Rate (L/min) or (mL/min)	Turbidity (NTU)	Purge Volume (L) or (mL)	Additional Comments
5 min	Δ < 10%	Δ < 10%			Δ < 0.1 pH		Δ < 0.3 ft	< 1L/min		< 0.5 L/min	Parameter Stabilization Limits (3 consecutive readings)
1405	24.6	0.61	24.5	1.83	7.01	176.0	46.35	125	OR		- water turbid
1408	24.7	0.61	6.7	0.55	6.94	169.0	46.63	325	OR		- cloudy orange
1411	25.2	0.62	4.6	0.38	6.93	159.9	46.99	250	OR		- likely injection related
1414	25.6	0.63	4.5	0.37	6.93	152.3	47.38	325	OR		- slight rancid odor
1417	25.6	0.63	4.7	0.38	6.93	144.0	47.38	300	OR		

≈ 0.75 gal Purged

Recorded By: DT

Jones Road Ground Water Plume Superfund Site, Houston, Harris County, Texas

Sheet 1 of 1
Date: 04/21/16

Ground Water Sampling Data Sheet

Well ID: MW-04 Sample ID: Sample Time: 0845

Casing diameter/type: 2" PVC
Screened interval(s): 20-35'
Total depth: 33
Initial depth to water (w/o pump): 12.65
Final depth to water (w/o pump): 13.46
Measuring point: **North side of casing**

Well location: Behind Melons
Sampling personnel: DT + AB
Sampling method: Low-flow micropurge
Water level indicator: Heron
Water quality meter: YSI Pro Plus
Pump depth setting: 30'

Weather: Humid, Overcast / Rain
Pump type/model: Monsoon SS

5 min	Δ < 10%	Δ < 10%			Δ < 0.1 pH		Δ < 0.3 ft	< 1L/min		< 0.5 L/min	Parameter Stabilization Limits (3 consecutive readings)
Time	Temp (°C)	Conductivity (mS/cm) or (µS/cm)	DO (%)	DO (mg/L)	pH	ORP (mV)	Water Level (feet btoc)	Flow Rate (L/min) or (mL/min)	Turbidity (NTU)	Purge Volume (L) or (mL)	Additional Comments
0828	20.4	0.98	2.2	0.19	7.03	-0.7	13.31	300	50.7		
0831	20.5	0.98	0.5	0.03	6.65	-30.2	14.61	300	—		- Slight drawdown
0835	20.5	0.98	0.3	0.02	6.66	-37.9	14.93	300	52.1		
0838	20.5	0.98	0.2	0.00	6.67	-40.4	15.21	400	52.0		
0841	20.6	0.98	-0.4	0.00	6.69	-42.0	15.38	300	45.2		

0.75 gal purged

Recorded By: DT

Jones Road Ground Water Plume Superfund Site, Houston, Harris County, Texas

Sheet 1 of 1
Date: 04/21/16

Ground Water Sampling Data Sheet

Well ID: MW-09 Sample ID: Sample Time: 1305

Casing diameter/type: 2" PVC
Screened interval(s): 20'-40'
Total depth: 37.71
Initial depth to water (w/o pump): 24.40
Final depth to water (w/o pump): 24.41
Measuring point: North side of casing

Well location: Ace Laydown area
Sampling personnel: DT + AB
Sampling method: Low-flow micropurge
Water level indicator: Heron
Water quality meter: YSI Pro Plus
Pump depth setting: 34.0'

Weather: Overcast / Wet
Pump type/model: Monsoon

5 min	Δ < 10%	Δ < 10%			Δ < 0.1 pH		Δ < 0.3 ft	< 1L/min		< 0.5 L/min	Parameter Stabilization Limits (3 consecutive readings)
Time	Temp (°C)	Conductivity (mS/cm) or (µS/cm)	DO (%)	DO (mg/L)	pH	ORP (mV)	Water Level (feet btoc)	Flow Rate (L/min) or (mL/min)	Turbidity (NTU)	Purge Volume (L) or (mL)	Additional Comments
1248	21.9	0.74	23.8	2.07	7.03	190.1	24.20	-	110		
1250	22.3	0.75	22.0	1.86	6.72	193.7	24.10	150	110		
1253	22.7	0.75	19.9	1.69	6.70	191.9	24.20	300	21		
1256	23.2	0.75	23.2	1.53	6.70	193.5	24.80	500	29.8		
1259	23.0	0.74	18.3	1.53	6.70	196.7	25.00	500	68.7		

Total Purge 0.75 gal

Recorded By: DT

Sheet 1 of 1
Date: 04/21/16

Ground Water Sampling Data Sheet

Well ID: MW-06 Sample ID: Sample Time: 1430

Casing diameter/type: 2" PVC
Screened interval(s): 20-35'
Total depth: 35.16
Initial depth to water (w/o pump): 26.71
Final depth to water (w/o pump): 29.80
Measuring point: North side of casing

Well location: SW site corner
Sampling personnel: DT + AB
Sampling method: Low-flow micropurge
Water level indicator: Heron
Water quality meter: YSI Pro Plus
Pump depth setting: 34'

Weather: Cloudy / Rain
Pump type/model: Monsoon 2"

5 min	Δ < 10%	Δ < 10%			Δ < 0.1 pH		Δ < 0.3 ft	< 1L/min		< 0.5 L/min	Parameter Stabilization Limits (3 consecutive readings)
Time	Temp (°C)	Conductivity (mS/cm) or (µS/cm)	DO (%)	DO (mg/L)	pH	ORP (mV)	Water Level (feet btoc)	Flow Rate (L/min) or (mL/min)	Turbidity (NTU)	Purge Volume (L) or (mL)	Additional Comments
1417	23.6	0.57	24.3	1.89	6.12	12.9	27.49	200	615N		- lots of injectate in water
1420	24.3	0.58	10.7	0.89	6.10	2.2	27.80	300	35NTU		
1423	25.1	0.53	6.2	0.51	6.10	-2.1	28.10	250	~~10.38~~ 139		- Strong odor
1426	25.2	0.58	5.1	0.43	6.10	-1.3	28.42	250	111		- very turbid, gray
1429	25.4	0.58	4.1	0.33	6.11	-0.4	28.82	400	189		10.38 - Turbidity Meter standard bump test
											- slight draw down / slow recharge

Approx ≈ 0.50 total gal purged

Recorded By: DT

Jones Road Ground Water Plume Superfund Site, Houston, Harris County, Texas

Sheet 1 of 1
Date: 04/21/16

Ground Water Sampling Data Sheet

Well ID: MW-22 Sample ID: Sample Time: 1535

Casing diameter/type: 2" PVC
Well location: SW Corner lot
Weather: Cloudy/Rain
Screened interval(s): 50-55
Sampling personnel: DT + AB
Total depth: 55'
Sampling method: Low-flow micropurge
Initial depth to water (w/o pump): 46.73
Water level indicator: Heron
Final depth to water (w/o pump): 47.19
Water quality meter: YSI Pro Plus
Measuring point: North side of casing
Pump depth setting: 52
Pump type/model: Monsoon SS

5 min	Δ < 10%	Δ < 10%			Δ < 0.1 pH		Δ < 0.3 ft	< 1L/min		< 0.5 L/min	Parameter Stabilization Limits (3 consecutive readings)
Time	Temp (°C)	Conductivity (mS/cm) or (µS/cm)	DO (%)	DO (mg/L)	pH	ORP (mV)	Water Level (feet btoc)	Flow Rate (L/min) or (mL/min)	Turbidity (NTU)	Purge Volume (L) or (mL)	Additional Comments
1522	24.2	1.23	12.0	0.97	6.36	-37.8	48.21	400	210.00		- water turbid
1525	24.7	1.22	2.5	0.19	6.30	-38.9	48.29	200	187MU		- strong micro. odor
1528	25.1	1.21	1.0	0.09	6.26	-34.8	48.28	300	- over		
1531	25.7	1.19	0.4	0.03	6.21	-21.0	48.52	682	- over		
1534	25.9	1.18	0.1	0.04	6.21	-14.7	48.46	300	158.0		

Total Purge 0.75 gal

Recorded By: DT

11/25/2015

Jones Road Ground Water Plume Superfund Site, Houston, Harris County, Texas

Sheet 1 of 1
Date: 22 Apr 2015

Ground Water Sampling Data Sheet

Well ID: MW-20 Sample ID: Sample Time: 1400

Casing diameter/type: 2" PVC
Well location: Cypress
Weather: Clear, Sunny
Screened interval(s):
Sampling personnel: RG/AB
Total depth: 29.5
Sampling method: Low-flow micropurge
Initial depth to water (w/o pump): 25.35
Water level indicator: Solinst.
Final depth to water (w/o pump): 25.42
Water quality meter: YSI - Pro Plus
Measuring point: North side of casing
Pump depth setting: ~~28.5~~ 28.0
Pump type/model: Monsoon (Stainless Steel)

5 min	Δ < 10%	Δ < 10%			Δ < 0.1 pH		Δ < 0.3 ft	< 1L/min		< 0.5 L/min	Parameter Stabilization Limits (3 consecutive readings)
Time	Temp (°C)	Conductivity (mS/cm) or ~~(µS/cm)~~	DO (%)	DO (mg/L)	pH	ORP (mV)	Water Level (feet btoc)	Flow Rate (L/min) or (mL/min)	Turbidity (NTU)	Purge Volume (L) or (mL)	Additional Comments
13:30											Pump on
13:32	26.9	1.13	3.5	0.27	6.44	145.9	25.78	200	2629	—	
13:35	27.1	1.12	2.7	0.21	6.33	114.5	~~1635~~ 25.89 RG	300	1635	—	
13:38	27.6	1.13	1.1	0.08	6.29	87.1	26.85	350	132	~1gal.	Flow fluctuating
13:41	27.8	1.13	0.0	0.00	6.29	58.2	26.26	450	122	—	
13:44	27.5	1.12	-0.2	---	6.31	40.8	26.37	450	77.6	—	Key parameters stabilized

By: Ryan Guth, GIT

Jones Road Ground Water Plume Superfund Site, Houston, Harris County, Texas

Sheet 1 of 1
Date: 22 APR 2016

Ground Water Sampling Data Sheet

Well ID: MW-03 | Sample ID: | Sample Time: 16:50

Casing diameter/type: 2" PVC
Screened interval(s):
Total depth: 35.5
Initial depth to water (w/o pump): 16.00
Final depth to water (w/o pump): 16.42
Measuring point: North side of casing

Well location: Behind MEKONG
Sampling personnel: RG & AB
Sampling method: Low-flow micropurge
Water level indicator: Solinst
Water quality meter: YSI
Pump depth setting: 33.0

Weather: Sunny ~ 79°
Pump type/model: SS Hurricane

Time	Temp (°C)	Conductivity (mS/cm) or (µS/cm)	DO (%)	DO (mg/L)	pH	ORP (mV)	Water Level (feet btoc)	Flow Rate ~~(L/min) or~~ (mL/min)	Turbidity (NTU)	Purge Volume (L) or (mL)	Additional Comments
5 min	Δ < 10%	Δ < 10%			Δ < 0.1 pH		Δ < 0.3 ft	< 1L/min		< 0.5 L/min	Parameter Stabilization Limits (3 consecutive readings)
16:37					Pump		On				All DTW include 7" riser
16:39	22.8	0.96	56.1	4.61	6.98	80.2	16.38	175	1377AU	—	(temp installed due to water)
16:42	22.2	0.95	44.8	3.89	6.68	85.0	16.55	450	2199AU	—	
16:45	22.3	0.95	44.8	3.89	6.66	88.3	16.52	450	723	—	
16:48	22.2	0.94	44.1	3.82	6.65	92.1	16.52	450	62NTU	—	
											SAMPLE.

Recorded By: Ryan Guth

Jones Road Ground Water Plume Superfund Site, Houston, Harris County, Texas

Sheet 1 of 1
Date: 22 APR 2016

Ground Water Sampling Data Sheet

Well ID: MW-02 | Sample ID: | Sample Time: 15:25

Casing diameter/type: 2" PVC
Well location: SHAW INDO-PAK & Jones Rd. Weather: Sunny ~ 78° Lt. Winds.
Screened interval(s):
Sampling personnel:
Total depth: 34.54
Sampling method: Low-flow micropurge ✓
Initial depth to water (w/o pump): 17.10
Water level indicator:
Final depth to water (w/o pump): 20.70
Water quality meter: YSI Pro Plus
Measuring point: North side of casing
Pump depth setting: 31' BTOC
Pump type/model: SS. MONSOON

5 min	Δ < 10%	Δ < 10%			Δ < 0.1 pH		Δ < 0.3 ft	< 1L/min		< 0.5 L/min	Parameter Stabilization Limits (3 consecutive readings)
Time	Temp (°C)	Conductivity (mS/cm) or (µS/cm)	DO (%)	DO (mg/L)	pH	ORP (mV)	Water Level (feet btoc)	Flow Rate ~~(L/min) or~~ (mL/min)	Turbidity (NTU)	Purge Volume (L) or (mL)	Additional Comments
14:54											Pump on
14:56	24.6	0.62	2.3	0.17	6.24	-112.6	18.42	400	2198 AU	—	-Black Precipitant (PPT) & Reducing Odor.
14:59	24.8	0.62	0.5	0.06	6.08	-92.5	19.03 x	350	1126	—	
15:02	24.9	0.62	-0.1	---	6.00	-98.5	20.20 x	500	932	—	
15:05	25.1	0.63	-0.7	---	6.02	-100.4	20.75 x	400	627 AU	—	flow fluctuating (uncontrollably)
15:08	24.7	0.63	-0.7	---	6.04	-99.2	21.70 ✓	275	-76 NTU	—	ODD TURBIDIM READINGS
15:11	25.3	0.66	-1.2	---	6.08	-98.3	21.90 x	300	-67 NTU	—	10 NTU STD = 9.73 ✓
15:14	24.9	0.66	-0.9	---	6.09	-98.3	22.60 ✓	200	-73 NTU	—	
15:17	25.2	0.68	-1.2	---	6.11	-98.2	22.65	200	53.0	—	SAMPLE

Recorded By: R. Goth, GIT

Jones Road Ground Water Plume Superfund Site, Houston, Harris County, Texas

Sheet 4 of 1
Date: 04/22/16

Ground Water Sampling Data Sheet

Well ID: MW-21 Sample ID: Sample Time: 10:55

Casing diameter/type: 2" PVC
Well location: Four Paws Store Front
Weather: Sunny 75°F

Screened interval(s): 25-30'
Sampling personnel: AB + RG

Total depth: 30'
Sampling method: Low-flow micropurge

Initial depth to water (w/o pump): 24.42
Water level indicator: Heron

Final depth to water (w/o pump): 24.46
Water quality meter: YSI Pro Plus

Measuring point: North side of casing
Pump depth setting: 28'
Pump type/model: Monsoon SS 2"

5 min	Δ < 10%	Δ < 10%			Δ < 0.1 pH		Δ < 0.3 ft	< 1L/min		< 0.5 L/min	Parameter Stabilization Limits (3 consecutive readings)
Time	Temp (°C)	Conductivity (mS/cm) or ~~(µS/cm)~~	DO (%)	DO (mg/L)	pH	ORP (mV)	Water Level (feet btoc)	Flow Rate (L/min) or (mL/min)	Turbidity (NTU)	Purge Volume (L) or (mL)	Additional Comments
10:19											Pump on
10:25	25°	1.00	2.1	0.17	6.74	194	24.90	500	63.4 ↓	—	
10:28	25.1	0.99	1.4	0.11	6.58	194.6	24.92	500	51.0 ↓	—	
10:31	25.5	0.99	0.3	0.02	6.56	196.8	24.89	400	25.7 ↓	—	
10:34	25.6	1.00	0.1	0.01	6.55	195.7	24.92	400	15.3 ↓	—	
10:37	25.5	0.99	-0.3	---	6.55	193.0	24.97	450	9.87		

Recorded By: DT / RG

Jones Road Ground Water Plume Superfund Site, Houston, Harris County, Texas

Sheet 1 of 1
Date: 7/23/16

Ground Water Sampling Data Sheet

Well ID: SVE-9 Sample ID: SVE-9 Sample Time: 11:35

Casing diameter/type: 2" PVC

Screened interval(s): 70-130'

Total depth: 130'

Initial depth to water (w/o pump): 106.25'

Final depth to water (w/o pump):

Measuring point: **North side of casing**

Well location: Cypress Center, 11600 Jones

Weather: Clear, 75°, 10mph wind

Sampling personnel: R. Guth, A. Bugher

Sampling method: **Low-flow micropurge**

Water level indicator:

Water quality meter: YSI professional plus

Pump depth setting: 118'

Pump type/model: mega monsoon pro

5 min	Δ < 10%	Δ < 10%			Δ < 0.1 pH		Δ < 0.3 ft	< 1L/min		< 0.5 L/min	Parameter Stabilization Limits (3 consecutive readings)
Time	Temp (°C)	Conductivity (mS/cm) or ~~(µS/cm)~~	DO (%)	DO (mg/L)	pH	ORP (mV)	Water Level (feet btoc)	Flow Rate (L/min) or (mL/min)	Turbidity (NTU)	Purge Volume (L) or (mL)	Additional Comments
11:16											Pump-on
11:18	24.7	0.82	78.0	6.44	7.51	84.1	~~106.25~~ ~107	500	15.8	0	using CMT w-L indicator
11:21	24.4	0.81	76.2	6.36	7.08	86.9	~107	800	32.7	~~0 gal~~	(Only 5' Gradations)
11:24	24.9	0.82	75.9	6.27	6.93	88.3	~107	900	27.6	~~0 gal~~	
11:27	25.0	0.82	72.7	5.98	6.91	90.0	~107.5	900	4.32	—	
11:30	25.1	0.82	73.0	5.98	6.90	92.8	~107.5	900	1.93	~4 gal	
											SAMPLE for VOCs

Recorded By: R. Guth

Jones Road Ground Water Plume Superfund Site, Houston, Harris County, Texas

Sheet 1 of 1
Date: 4/23/16

Ground Water Sampling Data Sheet

Well ID: SVE-06 Sample ID: SVE-06 Sample Time: 1340

Casing diameter/type: 2" PVC
Well location: Front of Exe Suites
Weather: Sunny ~85° F
Screened interval(s): —
Sampling personnel: RG/AB
Total depth: 130
Sampling method: Low-flow micropurge
Initial depth to water (w/o pump): 109'
Water level indicator: ~~Solinst~~ CMT 500'
Final depth to water (w/o pump): 109'
Water quality meter: YSI Pro Plus
Measuring point: North side of casing
Pump depth setting: 114'
Pump type/model: Mega Monsoon

5 min	Δ < 10%	Δ < 10%			Δ < 0.1 pH		Δ < 0.3 ft	< 1L/min		< 0.5 L/min	Parameter Stabilization Limits (3 consecutive readings)
Time	Temp (°C)	Conductivity (mS/cm) or (µS/cm)	DO (%)	DO (mg/L)	pH	ORP (mV)	Water Level (feet btoc)	Flow Rate (L/min) or (mL/min)	Turbidity (NTU)	Purge Volume (L) or (mL)	Additional Comments
13:33											Pump on
13:25	24.1	0.78	33.8	2.80	6.93	-22.8	109'	350	71,000	—	
13:28	24.0	0.77	30.0	2.52	6.91	-23.1	109'	450	71,000	—	
13:31	23.8	0.77	24.0	2.02	6.87	-16.6	109'	450	2884 AH	—	
13:34	24.4	0.77	20.5	1.65	6.86	-19.7	109'	450	2063	—	
13:37	25.0	0.78	16.7	1.37	6.87	-26.8	109'	350	1741	—	SAMPLE

Recorded By: Ryan Cath

ones Road Ground Water Plume Superfund Site, Houston, Harris County, Texas

Sheet 1 of 1
Date: 23 APR 2016

Ground Water Sampling Data Sheet

Well ID: SUB-07 Sample ID: Sample Time: 14:50

Casing diameter/type: 2" PVC
Screened interval(s):
Total depth: 130'
Initial depth to water (w/o pump): 109'
Final depth to water (w/o pump): 109'
Measuring point: **North side of casing**

Well location:
Sampling personnel: RG/AB
Sampling method: Low-flow micropurge
Water level indicator: Cmt. 500'
Water quality meter: YSI Pro Plus
Pump depth setting: 118

Weather: Sunny ~ 88°F
Pump type/model: Mega Monsoon (S.S.)

5 min	Δ < 10%	Δ < 10%			Δ < 0.1 pH		Δ < 0.3 ft	< 1L/min		< 0.5 L/min	Parameter Stabilization Limits (3 consecutive readings)
Time	Temp (°C)	Conductivity (mS/cm) or ~~(µS/cm)~~	DO (%)	DO (mg/L)	pH	ORP (mV)	Water Level (feet btoc)	Flow Rate (L/min) or (mL/min)	Turbidity (NTU)	Purge Volume (L) or (mL)	Additional Comments
14:38											Pump on.
14:39	24.8	0.64	75.3	6.14	7.02	87.8	~109	350	67 NTU	—	
14:42	24.5	0.62	71.5	5.92	6.89	95.5	109	400	97.2	—	
14:45	24.6	0.61	72.1	6.07	6.82	101.2	109	350	63.3	—	
14:48	24.8	0.60	71.4	6.01	6.80	103.9	109	500	38.0	—	
											SAMPLE

Recorded By: Ryan Guth

Ground Water Sampling Data Sheet

Well ID: SVE-08 Sample ID: Sample Time: 16:10

Casing diameter/type: 2" PVC
Well location: S. of ACE HDWR./OVERFLOW LOT
Weather: Pt Cloudy, ~88°F
Screened interval(s): ——
Sampling personnel: RG/AB
Total depth: 130
Sampling method: Low-flow micropurge
Initial depth to water (w/o pump): 103.75
Water level indicator:
Final depth to water (w/o pump):
Water quality meter: YSI - Pro Plus
Measuring point: **North side of casing**
Pump depth setting:
Pump type/model: Mega Monsoon

5 min	Δ < 10%	Δ < 10%			Δ < 0.1 pH		Δ < 0.3 ft	< 1L/min		< 0.5 L/min	Parameter Stabilization Limits (3 consecutive readings)
Time	**Temp (°C)**	**Conductivity (mS/cm) or (μS/cm)**	**DO (%)**	**DO (mg/L)**	**pH**	**ORP (mV)**	**Water Level (feet btoc)**	**Flow Rate ~~(L/min)~~ or (mL/min)**	**Turbidity (NTU)**	**Purge Volume (L) or (mL)**	**Additional Comments**
15:55	—	—	—	—	—	—	—	—	—	—	Pump on.
15:57	23.7	0.78	71.5	6.00	6.94	99.4	—	500	684	—	* No WL meter available
16:00	23.9	0.78	68.8	5.78	6.78	101.5	—	550	929	—	- during this well, use flow
16:03	24.1	0.79	69.2	5.77	6.79	103.1	—	~~1140~~ 950	114	—	- Rates from SVE-6,-7,-9
16:06	24.1	0.79	69.2	5.82	6.72	102.8	—	900	468	~3gal	
16:09	24.1	0.79	69.2	5.83	6.75	102.0	—	900	19.3	~4gal	(3.5 to 4gal)

Recorded By: Ryan Guth

Jones Road Superfund Site -
Harris County, Texas

Sheet 1 of 1
Date: 12/03/15

Field Record of Well Purging and Sampling

Well ID: MW-01 Sample ID: Sample Time: 0755

Casing diameter/type: 2" PVC Well location: Store front Halal Market Weather: Sunny 45°F

Screened interval(s): 25-35 Sampling personnel: Duane T, John B

Total depth: 35 Sampling method: low flow micro purge

Initial depth to water (w/o pump): 25.03 Water level indicator: Heron

Final depth to water (w/o pump): 25.33 Water quality meter: YSI Pro

Measuring point: **North side of casing** Pump depth setting: 30 Pump type/model: Monsoon Pro

Time	Temp (°C)	Conductiv (mS/cm) or (µS/cm)	%DO	DO (mg/L)	pH	ORP (mV)	Water Level (feet btoc)	Flow Rate (L/min) or (mL/min)	Turbidity (NTU)	Purge Volume (L) or (mL)	Additional Comments
0739	22.2	862	20.1	1.57	6.99	94.1	25.41	225	111		
0742	23.9	895	12.4	1.03	6.65	73.2	25.54	300	149		
0745	25.2	926	9.6	0.80	6.60	53.7	25.64	300	114		
1048	25.5	931	8.2	0.67	6.60	41.0	25.71	350	88.5		-slight drawdown
1051	25.8	934	7.4	0.60	6.60	21.6	25.81	350	58.9		

Recorded By: DT

Jones Road Superfund Site -
Harris County, Texas

Sheet 1 of 1
Date: 12/03/15

Field Record of Well Purging and Sampling

Well ID: MW-02 | Sample ID: | Sample Time: 0935

Casing diameter/type: 2" PVC
Well location: NW Corner Shopping Center lot
Weather: Sunny, 60°F
Screened interval(s): 2.5' - ~~35~~ 35
Sampling personnel: Duane Thomas, John Bonner
Total depth: 35'
Sampling method: low flow micro purge
Initial depth to water (w/o pump): 23.18
Water level indicator: Heron
Final depth to water (w/o pump): 23.58
Water quality meter: YSI Pro
Measuring point: North side of casing
Pump depth setting: 30
Pump type/model: Monsoon Pro

Time	Temp (°C)	Conductiv (mS/cm) or (µS/cm)	%DO	DO (mg/L)	pH	ORP (mV)	Water Level (feet btoc)	Flow Rate (L/min) or (mL/min)	Turbidity (NTU)	Purge Volume (L) or (mL)	Additional Comments
0914	22.3	817	31.3	2.68	6.73	148.7	24.30	225	463		
0917	22.4	847	26.8	2.31	6.72	125.6	24.35	250	464		
0920	23.5	866	27.6	2.33	6.72	110.7	24.56	250	415		
0923	23.8	875	33.0	2.82	6.72	98.6	24.72	325	229		
0926	24.0	880	34.1	2.88	6.74	90.3	24.83	275	144		
0929	23.7	878	31.5	2.63	6.74	83.7	24.82	250	104		

Recorded By: DT

Jones Road Superfund Site -
Harris County, Texas

Sheet 1 of 1
Date: 12/03/15

Field Record of Well Purging and Sampling

Well ID: MW-03 Sample ID: Sample Time: 1050

Casing diameter/type: 2" PVC
Well location: Behind Mekong Rest
Weather: Sunny 60°F
Screened interval(s): 2.5-35
Sampling personnel: Duane T. John B
Total depth: 35
Sampling method: lowflow micropurge
Initial depth to water (w/o pump): 22.21
Water level indicator: Heron
Final depth to water (w/o pump): 22.23
Water quality meter: YSI Pro
Measuring point: **North side of casing**
Pump depth setting: 30'
Pump type/model: Monsoon Pro

Time	Temp (°C)	Conductiv (mS/cm) or (µS/cm)	%DO	DO (mg/L)	pH	ORP (mV)	Water Level (feet btoc)	Flow Rate (L/min) or (mL/min)	Turbidity (NTU)	Purge Volume (L) or (mL)	Additional Comments
1033	20.2	878	24.3	2.14	6.56	140.3	22.50	300	308		
1036	20.3	902	18.7	1.66	6.59	123.7	22.56	250	286		
1039	21.8	925	16.1	1.41	6.62	110.6	22.62	400	195		
1042	21.8	966	13.3	1.16	6.60	99.4	22.60	400	97.9		
1045	21.1	1003	11.8	1.04	6.60	91.2	22.48	250	52.5		
1048	21.2	1014	11.2	0.99	6.60	84.2	22.48	250	49.9		

In Well purge

Recorded By: DT

Jones Road Superfund Site -
Harris County, Texas

Sheet 1 of 1
Date: 12/02/15

Field Record of Well Purging and Sampling

Well ID: MW-04 **Sample ID:** **Sample Time:** 1355

Casing diameter/type: 2" PVC
Well location: Behind Center at N treeline
Weather: Partly sunny 65°F
Screened interval(s): 2-35'
Sampling personnel: Duane T, John B
Total depth: 35'
Sampling method: Low flow micropurge
Initial depth to water (w/o pump): 21.63
Water level indicator: Heron
Final depth to water (w/o pump):
Water quality meter: YSI PRO
Measuring point: **North side of casing**
Pump depth setting: ~~30~~ 29'
Pump type/model: Monsoon Pro

Time	Temp (°C)	Conductiv (mS/cm) or (µS/cm)	%DO	DO (mg/L)	pH	ORP (mV)	Water Level (feet btoc)	Flow Rate (L/min) or (mL/min)	Turbidity (NTU)	Purge Volume (L) or (mL)	Additional Comments
1335	20.8	1495	24.8	2.17	7.04	-123.9	22.80	275	917		-removed mud plug
1338	21.6	1483	10.5	0.90	6.80	-171.7	23.10	375	242		-well had no lid, or no tight
1341	21.5	1463	9.7	0.85	6.77	-181.6	22.95	225	264		lid and was buried in mud
1344	21.5	1470	8.9	0.78	6.75	-186.2	22.95	275	193		-cleared mud plug
1347	21.7	1477	8.0	0.70	6.74	-189.1	22.98	275	118		-water very turbid.
1350	21.8	1478	7.6	0.67	6.74	-191.6	22.98	250	74.7		

~1.5 gal purged
(purged agitated water
from surging)

Recorded By: DT

Jones Road Superfund Site -
Harris County, Texas

Sheet 1 of 1
Date: 12/02/15

Field Record of Well Purging and Sampling

Well ID: MW-05 Sample ID: Sample Time: 1140

Casing diameter/type: 2" PVC
Well location: Behind Shopping Center
Weather: Cloudy ~60°F
Screened interval(s): 2'-35
Sampling personnel: Duane T. John B.
Total depth: 35.5'
Sampling method: low flow micro purge
Initial depth to water (w/o pump): 22.50
Water level indicator: Heron
Final depth to water (w/o pump): 22.64
Water quality meter: YSI Pro
Measuring point: **North side of casing**
Pump depth setting: 29
Pump type/model: Monsoon Pro

Time	Temp (°C)	Conductiv (mS/cm) or (µS/cm)	%DO	DO (mg/L)	pH	ORP (mV)	Water Level (feet btoc)	Flow Rate (L/min) or (mL/min)	Turbidity (NTU)	Purge Volume (L) or (mL)	Additional Comments
1123	21.9	1077	10.0	0.88	6.64	19.2	22.89	425	OR		-High turbidity
1126	22.2	1084	11.9	1.02	6.58	-1.2	22.79	200	OR		
1129	22.6	1081	9.6	0.82	6.58	-29.4	22.94	250	828		
1132	22.6	1076	9.1	0.82	6.59	-56.4	22.94	350	456		
1135	22.8	1078	8.8	0.76	6.59	-73.6	22.98	300	292		
1138	22.7	1075	8.4	0.72	6.60	-95.7	22.90	125	148		

Tl purge 0.58 gal

Recorded By: DT

Jones Road Superfund Site -
Harris County, Texas

Sheet 1 of 1
Date: 11/30/15

Field Record of Well Purging and Sampling

Well ID: MW-26 Sample ID: Sample Time:

Casing diameter/type: 2" PVC
Well location: SW Corner lot
Weather: Cloudy 50°F
Screened interval(s): 2-35'
Sampling personnel: John Bonner, Diane T
Total depth: 35'
Sampling method: Low Flow micropurge
Initial depth to water (w/o pump): 33.76
Water level indicator: Heron
Final depth to water (w/o pump):
Water quality meter: YSI Pro+
Measuring point: **North side of casing**
Pump depth setting: 34.5
Pump type/model: SS Monsoon

Time	Temp (°C)	Conductiv (mS/cm) or (µS/cm)	%DO	DO (mg/L)	pH	ORP (mV)	Water Level (feet btoc)	Flow Rate (L/min) or (mL/min)	Turbidity (NTU)	Purge Volume (L) or (mL)	Additional Comments
											X Very low water
											level may not
											low flow

Handwritten across the table:

* LOW FLOW NOT POSSIBLE
-no water from well, from pump
-will try grab with bailer 12/01
-will bail dry, sample 12/01

Recorded By: DT

Jones Road Superfund Site -
Harris County, Texas

Sheet 1 of 1
Date: 4/01/15

Field Record of Well Purging and Sampling

Well ID: MW-07 **Sample ID:** **Sample Time:**

Casing diameter/type: 2" PVC
Well location: BFE lot
Weather: Rain, 50°F
Screened interval(s): 20-35'
Sampling personnel: Duane Thomas, John B
Total depth: 35'
Sampling method: low flow micropump
Initial depth to water (w/o pump): 28.43
Water level indicator: Heron
Final depth to water (w/o pump):
Water quality meter: YSI Pro
Measuring point: **North side of casing**
Pump depth setting: 31'
Pump type/model: Pro Monsoon

Time	Temp (°C)	Conductiv (mS/cm) or (µS/cm)	%DO	DO (mg/L)	pH	ORP (mV)	Water Level (feet btoc)	Flow Rate (L/min) or (mL/min)	Turbidity (NTU)	Purge Volume (L) or (mL)	Additional Comments

* Casing Bent. Will not allow 2" bailer or 2" pump

will try pencil bailer or peristaltic later in the week.

Recorded By: DT

Jones Road Superfund Site -
Harris County, Texas

Sheet 1 of 1
Date: 12/02/15

Field Record of Well Purging and Sampling

Well ID: MW-08 | Sample ID: | Sample Time: 1025

Casing diameter/type: 2" PVC
Well location: BBQ Wood
Weather: Partly Cloudy 60°
Screened interval(s): 20.5-35.5
Sampling personnel: Duane Thomas
Total depth: 36.5
Sampling method: Low flow micropurge
Initial depth to water (w/o pump): 20.12
Water level indicator: Heron
Final depth to water (w/o pump): 20.22
Water quality meter: YSI Pro
Measuring point: **North side of casing**
Pump depth setting: 25'
Pump type/model: Monsoon Pro

Time	Temp (°C)	Conductiv (mS/cm) or (µS/cm)	%DO	DO (mg/L)	pH	ORP (mV)	Water Level (feet btoc)	Flow Rate (L/min) or (mL/min)	Turbidity (NTU)	Purge Volume (L) or (mL)	Additional Comments
1005	22.3	388.7	12.1	1.01	7.08	-87.0	20.50	300	565		-water filled with
1008	23.0	405.3	8.6	0.72	7.18	-117.0	20.65	400	698		debris
1011	23.2	414.0	7.6	0.65	7.18	-126.4	20.55	250	451		-odor of mud & debris
1014	23.1	433.1	7.2	0.62	7.05	-141.9	20.59	300	278		from filling during
1017	23.4	462.1	6.9	0.58	7.16	-147.4	20.60	425	198		destruction
1020	23.5	476.2	6.8	0.58	7.07	-140.0	20.74	425	158		-turbidity clearing
1023	23.4	493.7	6.6	0.56	7.07	-137.5	21.0	425	109		

≈ 1.0 gal purged

Recorded By: DT

Jones Road Superfund Site -
Harris County, Texas

Sheet 1 of 1
Date: 12

Field Record of Well Purging and Sampling

Well ID: MW-09 **Sample ID:** **Sample Time:** 0915

Casing diameter/type: 2" PVC
Well location: Ace South lot
Weather: Partly Cloudy 60°F
Screened interval(s): 20-35
Sampling personnel: Duane Thomas
Total depth: 35
Sampling method: low flow micropurge
Initial depth to water (w/o pump): 26.96
Water level indicator: Heron
Final depth to water (w/o pump): 27.74
Water quality meter: YSI PRO
Measuring point: **North side of casing**
Pump depth setting: 30'
Pump type/model: Monsoon Pro

Time	Temp (°C)	Conductiv (mS/cm) or (µS/cm)	%DO	DO (mg/L)	pH	ORP (mV)	Water Level (feet btoc)	Flow Rate (L/min) or (mL/min)	Turbidity (NTU)	Purge Volume (L) or (mL)	Additional Comments
0857 ~~20.0~~	19.9	673	26.5	2.53	6.92	160.9	28.19	250	300		-water slightly turbid
0900	20.6	691	24.9	2.23	6.71	156.1	27.91	200	272		
0903	21.3	698	22.4	1.98	6.66	152.6	28.13	200	367		
0906	21.3	702	21.2	1.88	6.65	150.0	28.19	200	315		
0909	22.1	710	19.7	1.70	6.65	147.2	28.20	200	258		
0912	22.1	712	18.5	1.60	6.65	143.6	28.25	175	184		

≈ 0.5 gal Purged

Recorded By: DT

Jones Road Superfund Site -
Harris County, Texas

Sheet 1 of 1
Date: 12/02/15

Field Record of Well Purging and Sampling

Well ID: MW-20 Sample ID: Sample Time:

Casing diameter/type: 2" PVC
Well location: Center West Main lot
Weather: Partly Cloudy
Screened interval(s): 25-30
Sampling personnel: Duane Thomas, John B
Total depth: 32'
Sampling method: low flow micro purge
Initial depth to water (w/o pump): 27.73
Water level indicator: Heron
Final depth to water (w/o pump):
Water quality meter: YSI Pro
Measuring point: **North side of casing**
Pump depth setting:
Pump type/model: Monsoon Pro

Time	Temp (°C)	Conductiv (mS/cm) or (µS/cm)	%DO	DO (mg/L)	pH	ORP (mV)	Water Level (feet btoc)	Flow Rate (L/min) or (mL/min)	Turbidity (NTU)	Purge Volume (L) or (mL)	Additional Comments
											*only 2.23' of water
											-water extremely turbid

MW-20 Will not low flow - not enough water
will bail dry then sample
-water basically mud

Recorded By: DT

Jones Road Superfund Site -
Harris County, Texas

Sheet 1 of 1
Date:

Field Record of Well Purging and Sampling

Well ID: MW-21 **Sample ID:** **Sample Time:** 1335

Casing diameter/type: 2" PVC
Well location: Storefront, Cave Level
Weather: Cloudy, cool - 50°
Screened interval(s): 25-30
Sampling personnel: Duane T, John B
Total depth: 32'
Sampling method: Lowflow micro purge
Initial depth to water (w/o pump): 27.49
Water level indicator: Heron
Final depth to water (w/o pump): 27.76
Water quality meter: YSI Pro
Measuring point: **North side of casing**
Pump depth setting: 29'
Pump type/model: Monsoon Pro

Time	Temp (°C)	Conductiv (mS/cm) or (µS/cm)	%DO	DO (mg/L)	pH	ORP (mV)	Water Level (feet btoc)	Flow Rate (L/min) or (mL/min)	Turbidity (NTU)	Purge Volume (L) or (mL)	Additional Comments
1321	23.7	1086	14.0	1.17	6.60	259.7	28.55	150	OR		-water turbid
1324	23.9	1097	15.1	1.26	6.50	239.1	28.42	150	OR		-very fine particles
1327	23.3	1084	14.3	1.22	6.51	228.1	28.21	150	OR		
1330	25.9	1147	11.9	0.97	6.52	211.5	29.00	350	OR		
1333	26.2	1154	10.0	0.80	6.52	202.1	29.00	150	OR		-probe on pump

≈ 0.5 gal purged

Recorded By: Dr

Jones Road Superfund Site -
Harris County, Texas

Sheet 1 of 1
Date: 11/30/15

Field Record of Well Purging and Sampling

Well ID: MW-22 **Sample ID:** **Sample Time:** 1358

Casing diameter/type: 2" PVC
Well location: SW Corner Cypress
Weather: Cloudy 50°
Screened interval(s):
Sampling personnel: Duane Thomas, John Bonner
Total depth: 55.50
Sampling method: Low flow micropurge
Initial depth to water (w/o pump): 49.34
Water level indicator: Heron
Final depth to water (w/o pump): ~~55.50~~ 49.40
Water quality meter: YSI Pro
Measuring point: **North side of casing**
Pump depth setting: 53'
Pump type/model: Monsoon Pro

Time	Temp (°C)	Conductiv (mS/cm) or (µS/cm)	%DO	DO (mg/L)	pH	ORP (mV)	Water Level (feet btoc)	Flow Rate (L/min) or (mL/min)	Turbidity (NTU)	Purge Volume (L) or (mL)	Additional Comments
1334	22.9	1030	43.2	3.47	6.46	196.9		325	26.9		* Water levels low
1337	24.4	1089	21.4	1.75	6.43	186.6	50.98	275	319		≈ 6' of water in well
1340	24.2	1089	13.2	1.10	6.45	178.0	50.71	225	946		-water turbid, check
1343	24.5	1094	11.3	0.95	6.46	172.4	50.49	200	OVER		blank 10.3 NTU
1346	24.1	1085	10.90	0.91	6.47	166.0	49.70	175	949		-very fine particles in
1349	23.9	1082	10.28	0.86	6.47	162.5	49.75	250	OVER		-raising pump to see if
1352	24.5	1096	9.5	0.78	6.47	156.5	49.75	150	OVER		turbidity clears
1355	24.6	1091	9.2	0.77	6.48	139.0	49.89	300	OVER		- super fine particles,
											pump pulled to 51'

≈ 3.0 Liters Purged

Recorded By: DT

Sheet 1 of 1
Date: 12/01/15

Field Record of Well Purging and Sampling

Well ID: MW23 Sample ID: Sample Time: 0845

Casing diameter/type: 2" PVC
Well location: BFE Lot
Weather: Rain, 50°F
Screened interval(s): 48-53'
Sampling personnel: Duane T & John B
Total depth: 55'
Sampling method: Low Flow Micropurge
Initial depth to water (w/o pump): ~~48.19~~ 46.42
Water level indicator: Heron
Final depth to water (w/o pump): 46.42
Water quality meter: YSI Pro
Measuring point: North side of casing
Pump depth setting: 50.5
Pump type/model: 3S Monsoon Pro

Time	Temp (°C)	Conductiv (mS/cm) or (uS/cm)	%DO	DO (mg/L)	pH	ORP (mV)	Water Level (feet btoc)	Flow Rate (L/min) or (mL/min)	Turbidity (NTU)	Purge Volume (L) or (mL)	Additional Comments
0832	23.5	617	21.9	1.58	6.81	6.81	48.01	200	89.6		
0835	22.5	620	17.7	1.54	6.78	-1796.4	47.80	2384	33.4		-orp seems to be affected by injectate
0838	23.0	630	15.8	1.34	6.78	-1326.7	47.63	225	161		
0841	22.2	622	15.4	1.34	6.79	-1884.8	47.40	150	192		
0844	22.2	634	15.1	1.29	6.79	-1860.7	47.35	100	158		

1/2 Purge ≈ 1 gal

will do

Recorded By: DT

Jones Road Superfund Site -
Harris County, Texas

Sheet 1 of 1
Date: 12/01/15

Field Record of Well Purging and Sampling

Well ID: MW-24 Sample ID: Sample Time: 1010

Casing diameter/type: 2" PVC
Well location: O'Reilly Lot
Weather: Rain, clouds 50° F
Screened interval(s): 48-53
Sampling personnel: John Bonner, Duane T
Total depth: 55
Sampling method: Low flow micropurge
Initial depth to water (w/o pump): 19.81
Water level indicator: Heron
Final depth to water (w/o pump): 21.74
Water quality meter: YSI Pro
Measuring point: North side of casing
Pump depth setting: 50.5'
Pump type/model: Monsoon Pro

Time	Temp (°C)	Conductiv (mS/cm) or (µS/cm)	%DO	DO (mg/L)	pH	ORP (mV)	Water Level (feet btoc)	Flow Rate (L/min) or (mL/min)	Turbidity (NTU)	Purge Volume (L) or (mL)	Additional Comments
0953	22.3	388.3	20.5	1.78	8.42	251.6	20.40	200	41.4		~slight drawdown
0956	22.6	533	16.5	1.39	7.18	236.8	21.10	250	48.8		
0959	21.8	528	15.8	1.34	7.12	230.4	21.75	350	65.9		
1002	23.9	546	12.9	1.07	7.11	224.4	22.01	200	53.5		
1005	23.3	521	12.1	1.03	7.19	214.6	22.70	200	33.8		

Purge 0.5 gal

Recorded By: DT

Jones Road Ground Water Plume Superfund Site, Houston, Harris County, Texas

Sheet ____ of ____
Date: 7/23/17

Ground Water Sampling Data Sheet

Well ID: Mw-01 **Sample ID:** Mw-01 **Sample Time:** 1040

Casing diameter/type: 2"
Well location: Infront of Halal Market
Weather: Clear, Warm 70°
Screened interval(s): 2.5 - 35'
Sampling personnel: U. Ganter A. Bugher
Total depth: 35
Sampling method: **Low-flow micropurge**
Initial depth to water (w/o pump): 22.10
Water level indicator: Geotech
Final depth to water (w/o pump): 22.34
Water quality meter: YSI
Measuring point: **North side of casing**
Pump depth setting: 28.5
Pump type/model: Monsoon

5 min	Δ < 10%	Δ < 10%			Δ < 0.1 pH		Δ < 0.3 ft	< 1L/min		< 0.5 L/min	Parameter Stabilization Limits (3 consecutive readings)
Time	**Temp (°C)**	**Conductivity (mS/cm) or (µS/cm)**	**DO (%)**	**DO (mg/L)**	**pH**	**ORP (mV)**	**Water Level (feet btoc)**	**Flow Rate (L/min) or (mL/min)**	**Turbidity (NTU)**	**Purge Volume (L) or (mL)**	**Additional Comments**
1016	25.7	1.70	9.0	0.73	6.50	-100.7	22.50	200	9.79		
1019	26.1	1.71	7.50	0.65	6.48	-107.8	22.82	400	9.42		
1022	26.3	1.71	7.40	0.59	6.48	-106.7	22.85	100	9.20		Duplicate
1025	26.4	1.72	6.9	0.55	6.48	-111.7	23.05	350	8.91		
1028	26.8	1.73	~~6.4~~ 3.6	0.28	6.47	-117.4	23.03	150	11.19		
1031											

Recorded By: W. Ganter

Jones Road Ground Water Plume Superfund Site, Houston, Harris County, Texas

Sheet ____ of ____
Date: 2/23/17

Ground Water Sampling Data Sheet

Well ID: MW-02 | Sample ID: MW-02 | Sample Time: 0940

Casing diameter/type: 2"
Well location: Street side of Market
Weather: Clear, Warm 75°
Screened interval(s): 2.5 - 35
Sampling personnel: W. Ganter A. Bugher
Total depth: 35
Sampling method: **Low-flow micropurge**
Initial depth to water (w/o pump): 19.13
Water level indicator: Geotech
Final depth to water (w/o pump): 20.68
Water quality meter: YSI
Measuring point: **North side of casing**
Pump depth setting: 26.5
Pump type/model: Monsoon

5 min	Δ < 10%	Δ < 10%			Δ < 0.1 pH		Δ < 0.3 ft	< 1L/min		< 0.5 L/min	Parameter Stabilization Limits (3 consecutive readings)
Time	**Temp (°C)**	**Conductivity (mS/cm) or (μS/cm)**	**DO (%)**	**DO (mg/L)**	**pH**	**ORP (mV)**	**Water Level (feet btoc)**	**Flow Rate (L/min) or (mL/min)**	**Turbidity (NTU)**	**Purge Volume (L) or (mL)**	**Additional Comments**
0920	22.4	1.11	16.7	1.33	6.59	-73.6	19.83	150	8.30		
0923	23.7	1.13	8.2	0.68	6.57	-89.9	20 ~~1~~.18 wy	150	8.37		
0926	23.8	1.14	5.1	0.42	6.57	-94.6	20 ~~1~~.31 wy	150	7.89		
0929	24.0	1.14	3.7	0.30	6.57	-95.6	20.63	150	5.85		
0932	24.0	1.15	2.4	0.24	6.57	-99.0	20.68	175	6.17		
0935											

Recorded By: W. Ganter

Jones Road Ground Water Plume Superfund Site, Houston, Harris County, Texas

Sheet _____ of _____
Date: 2/22/17

Ground Water Sampling Data Sheet

Well ID: Mw-03 **Sample ID:** MW-03 **Sample Time:** 1130

Casing diameter/type: 2"
Well location: Behind Mekong Sandwich
Weather: Clear, Warm 75°
Screened interval(s): 2.5-35'
Sampling personnel: W. Gantor A. Dugher
Total depth: 35'
Sampling method: **Low-flow micropurge**
Initial depth to water (w/o pump): 17.22
Water level indicator: Geotech
Final depth to water (w/o pump): 17.44
Water quality meter: YSI
Measuring point: **North side of casing**
Pump depth setting: 26.5
Pump type/model: Monsoon

5 min	Δ < 10%	Δ < 10%			Δ < 0.1 pH		Δ < 0.3 ft	< 1L/min		< 0.5 L/min	Parameter Stabilization Limits (3 consecutive readings)
Time	**Temp (°C)**	**Conductivity (mS/cm) or (µS/cm)**	**DO (%)**	**DO (mg/L)**	**pH**	**ORP (mV)**	**Water Level (feet btoc)**	**Flow Rate (L/min) or (mL/min)**	**Turbidity (NTU)**	**Purge Volume (L) or (mL)**	**Additional Comments**
11:00	21.8	0.61	5.7	0.49	6.80	-6.8	17.65	400	10.99		
11:03	21.4	0.61	4.2	0.37	6.79	-5.4	~~[illegible]~~ 17.95	450	10.46		
11:06	21.9	0.60	2.9	0.26	6.79	-27.2	17.92	450	8.74		
11:09	22.0	0.60	2.5%	0.22	6.78	-29.5	17.92	450	6.98		
11:12	21.9	0.60	2.0	0.18	6.79	-33.1	17.90	450	4.96		
11:15	21.4	0.59	1.6	0.14	6.79	-37.2	17.98	450	3.29		

Recorded By: W. Gantor

Jones Road Ground Water Plume Superfund Site, Houston, Harris County, Texas

Sheet ____ of ____
Date: 2/22/17

Ground Water Sampling Data Sheet

Well ID: MW-04 | Sample ID: MW-04 | Sample Time: 1240

Casing diameter/type: 2"
Screened interval(s): 2-35
Total depth: 35
Initial depth to water (w/o pump): 16.91
Final depth to water (w/o pump): 16.98
Measuring point: **North side of casing**

Well location: Behind Melong Sandwich
Weather: Clear, Warm 75°
Sampling personnel: W. Ganter A. Bugher
Sampling method: **Low-flow micropurge**
Water level indicator: Geotech
Water quality meter: YSI
Pump depth setting: 25.0
Pump type/model: Monsoon

5 min	Δ < 10%	Δ < 10%			Δ < 0.1 pH		Δ < 0.3 ft	< 1L/min		< 0.5 L/min	Parameter Stabilization Limits (3 consecutive readings)
Time	**Temp (°C)**	**Conductivity (mS/cm) or (µS/cm)**	**DO (%)**	**DO (mg/L)**	**pH**	**ORP (mV)**	**Water Level (feet btoc)**	**Flow Rate (L/min) or (mL/min)**	**Turbidity (NTU)**	**Purge Volume (L) or (mL)**	**Additional Comments**
1215	22.4	0.90	44.4	3.49	6.82	67.7	16.62	500	13.7		
1218	22.1	0.90	11.8	0.98	6.81	57.4	17.04	300	14.4		
1221	22.2	0.89	4.1	0.35	6.81	37.7	17.04	350	25.5		
1224	22.0	0.88	2.8	0.24	6.82	17.9	17.45	300	24.1		
1227	22.2	0.87	2.0	0.18	6.82	9.8	17.20	250	22.7		
1230	22.1	0.87	1.9	0.16	6.82	9.6	17.03	200	18.7		

Casing Full of Water / Water re-enters casing very quickly
Pumped out casing 4 times

Recorded By: W. Ganter

2/9/2017

Sheet _____ of _____
Date: 2/22/17

Ground Water Sampling Data Sheet

Well ID: MW-05 **Sample ID:** MW-05 **Sample Time:** 0930

Casing diameter/type: 2"
Well location: Back, Center Corner of Strip Mall
Weather: Clear, Warm 75°
Screened interval(s): 2-35
Sampling personnel: A. Bugher W. Ganter
Total depth: ~~47~~ 35'
Sampling method: **Low-flow micropurge**
Initial depth to water (w/o pump): 17.20
Water level indicator: Geotech
Final depth to water (w/o pump): 17.49
Water quality meter: YSI
Measuring point: **North side of casing**
Pump depth setting: 27.9
Pump type/model: Monsoon

5 min	Δ < 10%	Δ < 10%			Δ < 0.1 pH		Δ < 0.3 ft	< 1L/min		< 0.5 L/min	Parameter Stabilization Limits (3 consecutive readings)
Time	**Temp (°C)**	**Conductivity (mS/cm) or (µS/cm)**	**DO (%)**	**DO (mg/L)**	**pH**	**ORP (mV)**	**Water Level (feet btoc)**	**Flow Rate (L/min) or (mL/min)**	**Turbidity (NTU)**	**Purge Volume (L) or (mL)**	**Additional Comments**
0900	21.6	0.78	46.0	4.02	6.75	79.1	17.56	200	52.8		
0903	23.2	0.84	37.0	3.05	6.70	83.4	17.58	400	42.9		
0906	23.3	0.85	33.7	2.85	6.69	85.2	17.69	400	33.3		
0909	23.5	0.87	32.1	2.82	6.67	87.5	17.88	450	17.7		
0912	23.4	0.87	30.0	2.52	6.67	88.8	17.89	200	14.0		
0915	23.2	0.90	27.5	2.32	6.64	91.9	17.76	200	9.80		
										.5 gal	

Recorded By: W. Ganter

Jones Road Ground Water Plume Superfund Site, Houston, Harris County, Texas

Sheet ____ of ____
Date: 2/21/17

Ground Water Sampling Data Sheet

Well ID: Mw-06 | Sample ID: Mw-06 | Sample Time: 1500

Casing diameter/type: 2"
Well location: Western Edge of Parking Lot
Weather: Clear, Warm 75°
Screened interval(s): 2-35
Sampling personnel: W. Gamber A. Bugher
Total depth: 35
Sampling method: Low-flow micropurge
Initial depth to water (w/o pump): 33.42
Water level indicator: Geotech
Final depth to water (w/o pump): Non detect
Water quality meter: YSI
Measuring point: North side of casing
Pump depth setting: /
Pump type/model: Monsoon

5 min	Δ < 10%	Δ < 10%			Δ < 0.1 pH		Δ < 0.3 ft	< 1L/min		< 0.5 L/min	Parameter Stabilization Limits (3 consecutive readings)
Time	Temp (°C)	Conductivity (mS/cm) or (µS/cm)	DO (%)	DO (mg/L)	pH	ORP (mV)	Water Level (feet btoc)	Flow Rate (L/min) or (mL/min)	Turbidity (NTU)	Purge Volume (L) or (mL)	Additional Comments
											Low Water
											- Bailer

Recorded By: ____________________

Jones Road Ground Water Plume Superfund Site, Houston, Harris County, Texas

Sheet ____ of ____
Date: 2/20/17

Ground Water Sampling Data Sheet

Well ID: Mw-7 Sample ID: Mw-7 Sample Time: 1330

Casing diameter/type: 2"
Screened interval(s): 20-39
Total depth: 39
Initial depth to water (w/o pump): 28.35
Final depth to water (w/o pump): 28.55
Measuring point: **North side of casing**

Well location: Hair Store Parking Lot
Sampling personnel: W. Ganter A. Bugher
Sampling method: **Low-flow micropurge**
Water level indicator: Geotech
Water quality meter: YSI
Pump depth setting: /
Pump type/model: /

Weather: Cold, Heavy Rain 60°

5 min	Δ < 10%	Δ < 10%			Δ < 0.1 pH		Δ < 0.3 ft	< 1L/min		< 0.5 L/min	Parameter Stabilization Limits (3 consecutive readings)
Time	**Temp (°C)**	**Conductivity (mS/cm) or (µS/cm)**	**DO (%)**	**DO (mg/L)**	**pH**	**ORP (mV)**	**Water Level (feet btoc)**	**Flow Rate (L/min) or (mL/min)**	**Turbidity (NTU)**	**Purge Volume (L) or (mL)**	**Additional Comments**
											Bailer - Bent Casing
											Pump can not reach
											Water Column

Recorded By: W. Ganter

Jones Road Ground Water Plume Superfund Site, Houston, Harris County, Texas

Sheet _____ of _____
Date: 2/21/17

Ground Water Sampling Data Sheet

Well ID: Mw-08 | Sample ID: Mw-08 | Sample Time: 08:45

Casing diameter/type: 2"
Well location: Jns Rd. Tree Service - Entrance
Weather: Cool, cloudy 60°
Screened interval(s): 20.5 - 35.5
Sampling personnel: W. Ganter A Bugher
Total depth: 36.5
Sampling method: **Low-flow micropurge**
Initial depth to water (w/o pump): 16.60
Water level indicator: Geotech
Final depth to water (w/o pump): 16.57
Water quality meter: YSI
Measuring point: **North side of casing**
Pump depth setting: 26.31
Pump type/model: Monsoon

5 min	Δ < 10%	Δ < 10%			Δ < 0.1 pH		Δ < 0.3 ft	< 1L/min		< 0.5 L/min	Parameter Stabilization Limits (3 consecutive readings)
Time	**Temp (°C)**	**Conductivity (mS/cm) or (µS/cm)**	**DO (%)**	**DO (mg/L)**	**pH**	**ORP (mV)**	**Water Level (feet btoc)**	**Flow Rate (L/min) or (mL/min)**	**Turbidity (NTU)**	**Purge Volume (L) or (mL)**	**Additional Comments**
0823	21.6	0.90	8.6	0.69	6.49	221.7	16.75	200	17.4		
0826	22.2	0.86	5.6	0.49	6.65	189.9	16.76	300	16.9		
0829	22.8	0.85	10.4	0.80	6.63	179.6	16.85	350	13.0		
0832	23.3	0.85	3.0	0.25	6.63	167.8	16.90	350	10.59		
0835	23.6	0.85	0.20	2.3	6.63	156.3	16.84	300	7.74		
0838										0.25gal	

Recorded By: W. Ganter

Ground Water Sampling Data Sheet

Well ID: MW-09 Sample ID: MW-09 Sample Time: 0740

Casing diameter/type: 2"
Screened interval(s): 20-35
Total depth: 35
Initial depth to water (w/o pump): 20.41
Final depth to water (w/o pump): 20.73
Measuring point: **North side of casing**

Well location: ~~Appliance Store - E side of Jones Rd~~ w/ Ace Hardware
Sampling personnel: W. Ganter A. Bugher
Sampling method: **Low-flow micropurge**
Water level indicator: Geotech
Water quality meter: YSI
Pump depth setting: 28'

Weather: Cool, Clear 62°
Pump type/model: Monsoon

5 min	Δ < 10%	Δ < 10%			Δ < 0.1 pH		Δ < 0.3 ft	< 1L/min		< 0.5 L/min	Parameter Stabilization Limits (3 consecutive readings)
Time	**Temp (°C)**	**Conductivity (mS/cm) or (µS/cm)**	**DO (%)**	**DO (mg/L)**	**pH**	**ORP (mV)**	**Water Level (feet btoc)**	**Flow Rate (L/min) or (mL/min)**	**Turbidity (NTU)**	**Purge Volume (L) or (mL)**	**Additional Comments**
0718	20.9	1.09	17.1	1.45	6.61	90.6	22.50	600	6.11		
0721	22.6	1.04	13.8	1.17	6.59	84.7	22.53	150	6.51		
0724	22.5	1.09	10.5	0.99	6.59	77.6	22.80	400	6.86		
0727	22.9	1.08	7.1	0.63	6.59	78.0	22.68	300	4.43		
0730	22.9	1.07	6.4	0.54	6.59	75.4	22.63	500	3.80		
0733											

Recorded By: W. Ganter

Jones Road Ground Water Plume Superfund Site, Houston, Harris County, Texas

Sheet ____ of ____
Date: 2/21/17

Ground Water Sampling Data Sheet

Well ID: MW-20 Sample ID: MW-20 Sample Time: 1330

Casing diameter/type: 2"
Well location: East Side of Parking Lot
Weather: Warm, Clear 70°
Screened interval(s): 25-30
Sampling personnel:
Total depth: 32
Sampling method: **Low-flow micropurge**
Initial depth to water (w/o pump): 26.24
Water level indicator: Geotech
Final depth to water (w/o pump): 26.50
Water quality meter: YSI
Measuring point: **North side of casing**
Pump depth setting: ~~27.5~~ 29.5
Pump type/model: Monsoon

5 min	Δ < 10%	Δ < 10%			Δ < 0.1 pH		Δ < 0.3 ft	< 1L/min		< 0.5 L/min	Parameter Stabilization Limits (3 consecutive readings)
Time	**Temp (°C)**	**Conductivity (mS/cm) or (μS/cm)**	**DO (%)**	**DO (mg/L)**	**pH**	**ORP (mV)**	**Water Level (feet btoc)**	**Flow Rate (L/min) or (mL/min)**	**Turbidity (NTU)**	**Purge Volume (L) or (mL)**	**Additional Comments**
1312	26.2	1.86	12.7	1.02	6.34	-37.1	26.74	350	55.7		
1315	26.6	1.83	5.0	0.39	6.31	-34.1	26.70	300	41.1		
1318	27.2	1.85	2.7	0.21	6.30	-34.7	27.00	550	30.7		
1321	27.2	1.87	1.9	0.15	6.29	-31.7	27.10	400	15.7		
1324	27.2	1.93	1.5	0.12	6.29	-37.9	27.18	350	13.1		

Recorded By: W. Gantor

Jones Road Ground Water Plume Superfund Site, Houston, Harris County, Texas

Sheet ____ of ____
Date: 2/22/17

Ground Water Sampling Data Sheet

Well ID: MW-21 Sample ID: MW-21 Sample Time: 0800

Casing diameter/type: 2"
Screened interval(s): 25.3
Total depth: 32
Initial depth to water (w/o pump): 25.24
Final depth to water (w/o pump): 25.46
Measuring point: **North side of casing**

Well location: Infront of Audio Store
Sampling personnel: W. Ganter A Bugher
Sampling method: **Low-flow micropurge**
Water level indicator: Geotech
Water quality meter: YSI
Pump depth setting: ~~25.34~~ 27.5

Weather: Cool, Clear
Pump type/model: Monsoon

5 min	Δ < 10%	Δ < 10%			Δ < 0.1 pH		Δ < 0.3 ft	< 1L/min		< 0.5 L/min	Parameter Stabilization Limits (3 consecutive readings)
Time	**Temp (°C)**	**Conductivity (mS/cm) or (µS/cm)**	**DO (%)**	**DO (mg/L)**	**pH**	**ORP (mV)**	**Water Level (feet btoc)**	**Flow Rate (L/min) or (mL/min)**	**Turbidity (NTU)**	**Purge Volume (L) or (mL)**	**Additional Comments**
0731	21.9	1.05	24.5	2.04	6.64	113.4	25.57	250	5.83		
0734	23.5	1.04	12.8	1.04	6.60	84.5	25.65	400	3.95		
0737	24.7	1.02	6.1	0.48	6.65	68.3	25.72	450	2.81		
0740	24.3	1.01	3.4	0.28	6.64	65.1	25.62	300	1.73		
0743	24.5	1.01	2.3	0.17	6.65	57.3	25.40	800	1.56		
0746	24.8	1.01	1.5	0.13	6.65	44.8	25.69	250	1.44	0.3gal	

Recorded By: W. Ganter

Ground Water Sampling Data Sheet

Well ID: MW-22 **Sample ID:** MW-22 **Sample Time:** 1510

Casing diameter/type: 2"
Well location: E. Side Parking Lot
Weather: Warm, Clear 60°
Screened interval(s): 48-53
Sampling personnel: W. Gantor A. Bugler
Total depth: 55
Sampling method: **Low-flow micropurge**
Initial depth to water (w/o pump): 50.10
Water level indicator: Geotech
Final depth to water (w/o pump): 54.31
Water quality meter: YSI
Measuring point: **North side of casing**
Pump depth setting:
Pump type/model:

5 min	Δ < 10%	Δ < 10%			Δ < 0.1 pH		Δ < 0.3 ft	< 1L/min		< 0.5 L/min	Parameter Stabilization Limits (3 consecutive readings)
Time	**Temp (°C)**	**Conductivity (mS/cm) or (µS/cm)**	**DO (%)**	**DO (mg/L)**	**pH**	**ORP (mV)**	**Water Level (feet btoc)**	**Flow Rate (L/min) or (mL/min)**	**Turbidity (NTU)**	**Purge Volume (L) or (mL)**	**Additional Comments**
											Bailed

Recorded By: W. Gantor

Ground Water Sampling Data Sheet

Well ID: Mw-23 Sample ID: Mw-23 Sample Time: 1310

Casing diameter/type: 2"
Well location: Hair Store Parking Lot
Weather: Rain 63°
Screened interval(s): 48-53
Sampling personnel: W. Ganter A. Bugher
Total depth: 55
Sampling method: Low-flow micropurge
Initial depth to water (w/o pump): 44.45
Water level indicator: Geotech
Final depth to water (w/o pump): 45.10
Water quality meter: YSI
Measuring point: North side of casing
Pump depth setting: 51.0
Pump type/model: Monsoon

5 min	Δ < 10%	Δ < 10%			Δ < 0.1 pH		Δ < 0.3 ft	< 1L/min		< 0.5 L/min	Parameter Stabilization Limits (3 consecutive readings)
Time	Temp (°C)	Conductivity (mS/cm) or (µS/cm)	DO (%)	DO (mg/L)	pH	ORP (mV)	Water Level (feet btoc)	Flow Rate (L/min) or (mL/min)	Turbidity (NTU)	Purge Volume (L) or (mL)	Additional Comments
1250	23.8	0.66	7.5	0.63	6.92	61.3	46.77	450	22.0		
1253	23.9	0.66	7.6	0.65	6.95	39.2	46.72	500	above		
1256	23.7	0.66	8.7	0.74	6.96	25.5	47.56	250	76.2		
1259	23.6	0.67	6.6	0.54	6.94	16.1	46.78	300	38.7		
1302	24.2	0.68	5.9	0.48	6.94	12.9	47.10	300	20.4	.3 gal	
											No Lock
											FD 1: 1400

Recorded By: W. Ganter

Sheet ____ of ____
Date: 2/21/17

Ground Water Sampling Data Sheet

Well ID: MW-24 Sample ID: Mw-24 Sample Time: 1040

Casing diameter/type: 2"
Well location: Oreillys Parking Lot
Weather: Clear Warm 85°
Screened interval(s): 48-53
Sampling personnel: W. Ganter A. Bugher
Total depth: 55
Sampling method: **Low-flow micropurge**
Initial depth to water (w/o pump): 18.64
Water level indicator: Geotech
Final depth to water (w/o pump): 33.94
Water quality meter: YSI
Measuring point: **North side of casing**
Pump depth setting: 50.5
Pump type/model: Monsoon

5 min	Δ < 10%	Δ < 10%			Δ < 0.1 pH		Δ < 0.3 ft	< 1L/min		< 0.5 L/min	Parameter Stabilization Limits (3 consecutive readings)
Time	**Temp (°C)**	**Conductivity (mS/cm) or (μS/cm)**	**DO (%)**	**DO (mg/L)**	**pH**	**ORP (mV)**	**Water Level (feet btoc)**	**Flow Rate (L/min) or (mL/min)**	**Turbidity (NTU)**	**Purge Volume (L) or (mL)**	**Additional Comments**
1005	23.8	0.257	53.3	4.38	8.11	134.5	18.34	400	14.87		
1008	24.7	0.428	24.0	1.97	7.13	136.8	19.60	125	14.1		
1011	24.6	0.53	18.0	1.48	7.06	134.0	20.14	150	21.7		
1014	24.4	0.56	17.1	1.52	7.03	132.7	20.94	300	19.9		
1017	24.6	0.58	15.6	1.29	7.01	131.3	21.22	200	16.7		
1020	24.7	0.58	13.5	1.11	7.02	133.1	21.48	350	14.9		
1023	25.0	0.58	11.7	0.97	6.99	131.6	22.79	150	14.4		
1026	24.9	0.59	10.9	0.91	7.00	131.7	23.64	100	12.7		
1029	25.0	0.58	10.7	0.89	7.01	131.9	24.46	250	12.8		
1032	25.1	0.57	11.2	0.83	7.04	131.5	25.62	250	14.3		
											TB1 - 0800am

Recorded By: W. Ganter

Jones Road Ground Water Plume Superfund Site, Houston, Harris County, Texas

Sheet ____ of ____
Date: 2/20/17

Ground Water Sampling Data Sheet

Well ID: Mw-25 | Sample ID: Mw-25 | Sample Time: /

Casing diameter/type: 2"
Well location: Appliance Store
Weather: ~~[illegible]~~ Clear, Warm 58°
Screened interval(s): 23-28
Sampling personnel: W. Ganter A. Bugler
Total depth: 30
Sampling method: **Low-flow micropurge**
Initial depth to water (w/o pump): 29.42
Water level indicator: Geotech
Final depth to water (w/o pump): /
Water quality meter: YSI
Measuring point: **North side of casing**
Pump depth setting: /
Pump type/model: /

5 min	Δ < 10%	Δ < 10%			Δ < 0.1 pH		Δ < 0.3 ft	< 1L/min		< 0.5 L/min	Parameter Stabilization Limits (3 consecutive readings)
Time	**Temp (°C)**	**Conductivity (mS/cm) or (µS/cm)**	**DO (%)**	**DO (mg/L)**	**pH**	**ORP (mV)**	**Water Level (feet btoc)**	**Flow Rate (L/min) or (mL/min)**	**Turbidity (NTU)**	**Purge Volume (L) or (mL)**	**Additional Comments**
											No water
											Unable to Pump or
											Bail From Well
											No Samples Taken

Recorded By: W. Ganter

Jones Road Ground Water Plume Superfund Site, Houston, Harris County, Texas

Sheet _____ of _____
Date: 5/24/18

Ground Water Sampling Data Sheet

Well ID: Mw-01 **Sample ID:** Mw-01 **Sample Time:** 0830

Casing diameter/type: 2"	Well location: Halal market front	Weather: Cooler 80° Clear	
Screened interval(s): 25-35	Sampling personnel: WG/JB		
Total depth: 35	Sampling method: **Low-flow micropurge**		
Initial depth to water (w/o pump): 24.24	Water level indicator: Heron		
Final depth to water (w/o pump): 25.72	Water quality meter: YSI		
Measuring point: **North side of casing**	Pump depth setting: 30	Pump type/model: SS Monsoon	

5 min	Δ < 10%	Δ < 10%			Δ < 0.1 pH		Δ < 0.3 ft	< 1L/min		< 0.5 L/min	Parameter Stabilization Limits (3 consecutive readings)
Time	**Temp (°C)**	**Conductivity (mS/cm) or (µS/cm)**	**DO (%)**	**DO (mg/L)**	**pH**	**ORP (mV)**	**Water Level (feet btoc)**	**Flow Rate (L/min) or (mL/min)**	**Turbidity (NTU)**	**Purge Volume (L) or (mL)**	**Additional Comments**
0750	25.24	1.363	74.1	5.80	6.59	-166.4	350	25.62	27.5		
0755	25.54	1.368	19.0	1.54	6.56	-149.7	25.94	375	13.6		
0800	25.71	1.367	14.9	1.21	6.55	-146.3	26.34	400	10.88		
0805	25.83	1.364	12.3	0.49	6.54	-156.3	26.36	400	7.68		
0810	25.94	1.362	12.0	0.97	6.54	-158.3	26.59	350	6.50		
0815	26.01	1.362	13.4	1.08	6.54	-146.9	26.59	350	4.42		
0820	26.08	1.365	13.0	1.05	6.54	-141.3	26.64	350	3.67		

Recorded By: W. Gunter

Date: 5/23/18

Ground Water Sampling Data Sheet

Well ID: Mw-02 | Sample ID: Mw-02 | Sample Time: 1340

Casing diameter/type: 2"
Well location: Jones Rd.
Weather: Rain 90°

Screened interval(s): 25-35
Sampling personnel: JB/WG

Total depth: 35
Sampling method: **Low-flow micropurge**

Initial depth to water (w/o pump): 21.65
Water level indicator: Heron

Final depth to water (w/o pump): 23.86
Water quality meter: YSI

Measuring point: **North side of casing**
Pump depth setting: 30
Pump type/model: SS Monsoon

5 min	Δ < 10%	Δ < 10%			Δ < 0.1 pH		Δ < 0.3 ft	< 1L/min		< 0.5 L/min	Parameter Stabilization Limits (3 consecutive readings)
Time	**Temp (°C)**	**Conductivity (mS/cm) or (μS/cm)**	**DO (%)**	**DO (mg/L)**	**pH**	**ORP (mV)**	**Water Level (feet btoc)**	**Flow Rate (L/min) or (mL/min)**	**Turbidity (NTU)**	**Purge Volume (L) or (mL)**	**Additional Comments**
1305	23.88	1.042	396.5	31.18	6.83	-202.5	~~22.50~~ 25.05 wg	~~35.00~~ 350 wg	1034 av		
1310	23.88	1.040	47.6	3.72	6.79	-222.4	25.04	300	-32.0		
1315	24.10	1.037	18.6	1.54	6.79	-203.2	25.34	375	55.0		
1320	24.45	1.035	12.9	1.07	6.76	-200.8	25.54	375	39.5		
1325	24.58	1.033	12.1	1.01	6.76	-204.6	25.54	400	27.0		
1330	24.67	1.032	11.3	0.93	6.77	-192.7	25.56	375	22.3		

Recorded By: W. Gunter

Jones Road Ground Water Plume Superfund Site, Houston, Harris County, Texas

Sheet _____ of _____
Date: 5/22/18

Ground Water Sampling Data Sheet

Well ID: MW-03 Sample ID: MW-03 Sample Time: 1140

Casing diameter/type: 2"
Well location: Behind McLong
Weather: 10000°F 100% Humidity Sunny Lightning moving in.
Screened interval(s): 25-35
Sampling personnel: WG/JB
Total depth: 35
Sampling method: **Low-flow micropurge**
Initial depth to water (w/o pump): 20.80
Water level indicator: Heron
Final depth to water (w/o pump): 21.04
Water quality meter: YSI
Measuring point: **North side of casing**
Pump depth setting: 30
Pump type/model:

5 min	Δ < 10%	Δ < 10%			Δ < 0.1 pH		Δ < 0.3 ft	< 1L/min		< 0.5 L/min	Parameter Stabilization Limits (3 consecutive readings)
Time	**Temp (°C)**	**Conductivity (mS/cm) or (µS/cm)**	**DO (%)**	**DO (mg/L)**	**pH**	**ORP (mV)**	**Water Level (feet btoc)**	**Flow Rate (L/min) or (mL/min)**	**Turbidity (NTU)**	**Purge Volume (L) or (mL)**	**Additional Comments**
1110	23.54	0.537	206.3	12.94	6.89	38.5	21.34	300	71		
1115	23.21	0.531	45.8	3.75	6.58	42.9	21.37	350	112.0		
1120	23.36	0.532	34.4	2.92	6.64	40.5	21.41	350	95.2		
1125	23.41	0.533	30.6	2.57	6.71	39.2	21.44	350	82.3		
1130	23.22	0.535	24.9	2.12	6.72	43.5	21.47	350	44.5		
1135	23.20	0.536	20.2	1.71	6.73	42.5	21.48	350	32.3		

Recorded By: W. Gonto

Sheet _____ of _____
Date: 5/23/18

Ground Water Sampling Data Sheet

Well ID: Mw-04 Sample ID: Mw-04 Sample Time: 1100

Casing diameter/type: 2"
Well location: Behind Mekong
Weather: Cloudy, stormy 90°
Screened interval(s): 25-35
Sampling personnel: WG/JB
Total depth: 35
Sampling method: Low-flow micropurge
Initial depth to water (w/o pump): 21.10
Water level indicator: Heron
Final depth to water (w/o pump): 21.47
Water quality meter: YSI
Measuring point: North side of casing
Pump depth setting: 30
Pump type/model: SS Monsoon

5 min	Δ < 10%	Δ < 10%			Δ < 0.1 pH		Δ < 0.3 ft	< 1L/min		< 0.5 L/min	Parameter Stabilization Limits (3 consecutive readings)
Time	Temp (°C)	Conductivity (mS/cm) or (µS/cm)	DO (%)	DO (mg/L)	pH	ORP (mV)	Water Level (feet btoc)	Flow Rate (L/min) or (mL/min)	Turbidity (NTU)	Purge Volume (L) or (mL)	Additional Comments
1030	23.43	1.909	28.3	2.22	6.86	-241.3	22.47	400	-30		
1035	22.71	1.971	14.6	1.25	6.76	-232.3	22.60	300	49.4		
1040	22.59	1.976	11.2	0.96	6.76	-228.4	22.73	300	38.6		
1045	22.59	1.963	0.97	11.2	6.76	-197.6	22.86	300	31.6		
1050	22.60	1.930	11.1	0.95	6.75	-202.4	22.92	325	20.8		
1055	22.58	1.836	11.1	0.95	6.73	-201.5	23.01	325	16.2		

Recorded By: W. Gantor

Jones Road Ground Water Plume Superfund Site, Houston, Harris County, Texas

Sheet _____ of _____
Date: 5/2/18

Ground Water Sampling Data Sheet

Well ID: MW-05 Sample ID: MW-05 Sample Time: 1450

Casing diameter/type: 2"
Well location: Behind MeLong
Weather: 90 - 100 [illegible]
Screened interval(s): 25.5- 35.50
Sampling personnel: UG/JB
Total depth: 35.5
Sampling method: **Low-flow micropurge**
Initial depth to water (w/o pump): 21.60
Water level indicator: Heron
Final depth to water (w/o pump): 22.34
Water quality meter: YSI
Measuring point: **North side of casing**
Pump depth setting: 30
Pump type/model: SS Monsoon

5 min	Δ < 10%	Δ < 10%			Δ < 0.1 pH		Δ < 0.3 ft	< 1L/min		< 0.5 L/min	Parameter Stabilization Limits (3 consecutive readings)
Time	**Temp (°C)**	**Conductivity (mS/cm) or (µS/cm)**	**DO (%)**	**DO (mg/L)**	**pH**	**ORP (mV)**	**Water Level (feet btoc)**	**Flow Rate (L/min) or (mL/min)**	**Turbidity (NTU)**	**Purge Volume (L) or (mL)**	**Additional Comments**
1400	24.39	1.300	65.3	5.29	6.54	48.7	22.08	300	1677AV		Water is orange from
1405	23.19	1.327	27.9	2.36	6.42	23.5	22.07	250	1920AV		injection
1410	23.63	1.325	18.5	1.56	6.45	2.1	22.10	300	1511 av		
1415	23.75	1.319	15.9	1.33	6.47	-4.5	22.14	300	1177av		
1420	23.85	1.313	14.1	1.18	6.47	-9.0	22.06	250	775av		
1425	23.98	1.309	12.7	1.07	6.47	-10.8	22.11	350	699av		

Recorded By: W. Gunter

Jones Road Ground Water Plume Superfund Site, Houston, Harris County, Texas

Sheet _____ of _____
Date: 5/22/18

Ground Water Sampling Data Sheet

Well ID: Mw-6 | Sample ID: Mw-6 | Sample Time: 0920

Casing diameter/type: 2"
Well location:
Weather:
Screened interval(s):
Sampling personnel:
Total depth:
Sampling method: **Low-flow micropurge**
Initial depth to water (w/o pump): 33.80
Water level indicator:
Final depth to water (w/o pump): Dry
Water quality meter: YSI
Measuring point: **North side of casing**
Pump depth setting:
Pump type/model:

5 min	Δ < 10%	Δ < 10%			Δ < 0.1 pH		Δ < 0.3 ft	< 1L/min		< 0.5 L/min	Parameter Stabilization Limits (3 consecutive readings)
Time	**Temp (°C)**	**Conductivity (mS/cm) or (µS/cm)**	**DO (%)**	**DO (mg/L)**	**pH**	**ORP (mV)**	**Water Level (feet btoc)**	**Flow Rate (L/min) or (mL/min)**	**Turbidity (NTU)**	**Purge Volume (L) or (mL)**	**Additional Comments**
			Bailer								

Recorded By: W. Garter

Ground Water Sampling Data Sheet

Well ID: MW-7 | Sample ID: MW-7 | Sample Time: 1300

Casing diameter/type: 2"
Well location: BFE Rock Club Parking Lot
Weather: PC/HOT-90°F
Screened interval(s): 20-35
Sampling personnel: WG/JTB
Total depth: 35
Sampling method: **Low-flow micropurge**
Initial depth to water (w/o pump): 29.43
Water level indicator: Heron
Final depth to water (w/o pump): 29.71
Water quality meter: YSI
Measuring point: **North side of casing**
Pump depth setting:
Pump type/model: SS Monsoon

5 min	Δ < 10%	Δ < 10%			Δ < 0.1 pH		Δ < 0.3 ft	< 1L/min		< 0.5 L/min	Parameter Stabilization Limits (3 consecutive readings)
Time	**Temp (°C)**	**Conductivity (mS/cm) or (µS/cm)**	**DO (%)**	**DO (mg/L)**	**pH**	**ORP (mV)**	**Water Level (feet btoc)**	**Flow Rate (L/min) or (mL/min)**	**Turbidity (NTU)**	**Purge Volume (L) or (mL)**	**Additional Comments**
			Bail								

Recorded By: ____________________

Jones Road Ground Water Plume Superfund Site, Houston, Harris County, Texas

Sheet _____ of _____
Date: 5/24/18

Ground Water Sampling Data Sheet

Well ID: Mw-08 Sample ID: Sample Time:

Casing diameter/type: 2"
Screened interval(s):
Total depth:
Initial depth to water (w/o pump):
Final depth to water (w/o pump):
Measuring point: **North side of casing**

Well location:
Sampling personnel:
Sampling method: **Low-flow micropurge**
Water level indicator:
Water quality meter: YSI
Pump depth setting:

Weather:
Pump type/model:

5 min	Δ < 10%	Δ < 10%			Δ < 0.1 pH		Δ < 0.3 ft	< 1L/min		< 0.5 L/min	Parameter Stabilization Limits (3 consecutive readings)
Time	**Temp (°C)**	**Conductivity (mS/cm) or (µS/cm)**	**DO (%)**	**DO (mg/L)**	**pH**	**ORP (mV)**	**Water Level (feet btoc)**	**Flow Rate (L/min) or (mL/min)**	**Turbidity (NTU)**	**Purge Volume (L) or (mL)**	**Additional Comments**
											- Well is under large
											Woodpile - inaccesible

Recorded By: ____________________

Jones Road Ground Water Plume Superfund Site, Houston, Harris County, Texas

Sheet ____ of ____
Date: 5/24/18

Ground Water Sampling Data Sheet

Well ID: MW-09 Sample ID: MW-09 Sample Time: 1000

Casing diameter/type: 2"
Well location: Ace Hardware Lot
Weather: Clear, Breeze 82°
Screened interval(s): 20-35
Sampling personnel: WG / JB
Total depth: 35'
Sampling method: **Low-flow micropurge**
Initial depth to water (w/o pump): 24.33
Water level indicator: Heron
Final depth to water (w/o pump): 25.36
Water quality meter: YSI
Measuring point: **North side of casing**
Pump depth setting:
Pump type/model: SS Monsoon

5 min	Δ < 10%	Δ < 10%			Δ < 0.1 pH		Δ < 0.3 ft	< 1L/min		< 0.5 L/min	Parameter Stabilization Limits (3 consecutive readings)
Time	**Temp (°C)**	**Conductivity (mS/cm) or (µS/cm)**	**DO (%)**	**DO (mg/L)**	**pH**	**ORP (mV)**	**Water Level (feet btoc)**	**Flow Rate (L/min) or (mL/min)**	**Turbidity (NTU)**	**Purge Volume (L) or (mL)**	**Additional Comments**
0920	23.84	1.071	24.7	1.98	6.68	-13.1	25.71	200	120.0		
0925	23.68	1.065	18.0	1.52	6.51	10.6	25.18	300	106.4		
0930	23.64	1.058	14.4	1.21	6.53	10.3	~~25.24~~ 25.23	250	124.0		
0935	23.86	1.056	11.6	0.97	6.56	8.2	25.29	300	125.0		
0940	24.04	1.048	10.0	0.83	6.59	-7.8	25.31	225	94.3		
0945	24.06	1.045	9.2	0.77	6.58	7.7	25.39	300	84.7		
0950	24.14	1.042	7.1	0.60	6.59	9.0	25.46	300	56.0		

Recorded By: W. Ganter

Jones Road Ground Water Plume Superfund Site, Houston, Harris County, Texas

Sheet ____ of ____

Date: 5/23/18

Ground Water Sampling Data Sheet

+ 1100 5/24/18 MNA

Well ID: Mw-20 Sample ID: Mw-20 Sample Time: 0940

Casing diameter/type: 2"

Well location: Parking lot

Weather:

Screened interval(s): 20-32.5

Sampling personnel: WG/JB

Total depth: 29.63

Sampling method: **Low-flow micropurge**

Initial depth to water (w/o pump): 27.71

Water level indicator: Heron

Final depth to water (w/o pump): 29.03

Water quality meter: YSI

Measuring point: **North side of casing**

Pump depth setting:

Pump type/model:

5 min	Δ < 10%	Δ < 10%			Δ < 0.1 pH		Δ < 0.3 ft	< 1L/min		< 0.5 L/min	Parameter Stabilization Limits (3 consecutive readings)
Time	**Temp (°C)**	**Conductivity (mS/cm) or (µS/cm)**	**DO (%)**	**DO (mg/L)**	**pH**	**ORP (mV)**	**Water Level (feet btoc)**	**Flow Rate (L/min) or (mL/min)**	**Turbidity (NTU)**	**Purge Volume (L) or (mL)**	**Additional Comments**
				Bailer							Water level too low to pump will bail for Sample
				EPA = 5/23/18 0940							After collecting Vocs, water turns to mud. Collect DM for epa due to filter. Clog 3 filters in the process due to mud. 2in of water in bailer with each recovery all mud. Private lab MNA will not be collected.
				Private = 5/24/18 1100							

Recorded By: W. Gentor

Jones Road Ground Water Plume Superfund Site, Houston, Harris County, Texas

Sheet ____ of ____
Date: 5/23/18

Ground Water Sampling Data Sheet

Well ID: Mw-21 Sample ID: Mw-21 Sample Time: 0830

Casing diameter/type: 2"
Well location: Site Parking lot
Weather: Hot, humid; Sun 90°
Screened interval(s):
Sampling personnel: WG/JB
Total depth: 24.73
Sampling method: Low-flow micropurge
Initial depth to water (w/o pump): 27.11
Water level indicator: Heron
Final depth to water (w/o pump): 27.50
Water quality meter: YSI
Measuring point: North side of casing
Pump depth setting:
Pump type/model: SS Monsoon

5 min	Δ < 10%	Δ < 10%			Δ < 0.1 pH		Δ < 0.3 ft	< 1L/min		< 0.5 L/min	Parameter Stabilization Limits (3 consecutive readings)
Time	Temp (°C)	Conductivity (mS/cm) or (µS/cm)	DO (%)	DO (mg/L)	pH	ORP (mV)	Water Level (feet btoc)	Flow Rate (L/min) or (mL/min)	Turbidity (NTU)	Purge Volume (L) or (mL)	Additional Comments
0805	25.06	1.042	55.6	4.42	6.67	-41.6	29.68	300	OR		Well not recharging
0810	25.34	1.017	21.5	1.75	6.61	-60.3	28.62	350	2716		Pull pump and bail
											for sample
				Bail							

Recorded By: W. Grantor

5/18/2018

Jones Road Ground Water Plume Superfund Site, Houston, Harris County, Texas

Sheet ____ of ____

Date: 5/22/18

Ground Water Sampling Data Sheet

Well ID: MW-22 Sample ID: MW-22 Sample Time: 0945

Casing diameter/type: 2"

Screened interval(s): 48-53

Total depth: 55

Initial depth to water (w/o pump): 46.04

Final depth to water (w/o pump): 47.06

Measuring point: **North side of casing**

Well location: Site Parking lot

Sampling personnel: WG/JB

Sampling method: **Low-flow micropurge**

Water level indicator: Heron

Water quality meter: YSI

Pump depth setting:

Weather: Clear, Hot 90°

Pump type/model:

5 min	Δ < 10%	Δ < 10%			Δ < 0.1 pH		Δ < 0.3 ft	< 1L/min		< 0.5 L/min	Parameter Stabilization Limits (3 consecutive readings)
Time	**Temp (°C)**	**Conductivity (mS/cm) or (μS/cm)**	**DO (%)**	**DO (mg/L)**	**pH**	**ORP (mV)**	**Water Level (feet btoc)**	**Flow Rate (L/min) or (mL/min)**	**Turbidity (NTU)**	**Purge Volume (L) or (mL)**	**Additional Comments**
				Bailer							

Recorded By: W. Gantler

Jones Road Ground Water Plume Superfund Site, Houston, Harris County, Texas

Sheet _____ of _____
Date: 5/21/18

Ground Water Sampling Data Sheet

Well ID: MW-23 | Sample ID: MW-23 | Sample Time: 1230

Casing diameter/type: 2"
Well location: BFE Rock Club Parking Lot
Weather: PC / Hot 90F w/ 1000% Humidity
Screened interval(s): 48-53
Sampling personnel: WG / JTB - The CMT Cowboys
Total depth: 55
Sampling method: **Low-flow micropurge**
Initial depth to water (w/o pump): 45.39
Water level indicator: Heron
Final depth to water (w/o pump): 46.13
Water quality meter: YSI
Measuring point: **North side of casing**
Pump depth setting: 50'
Pump type/model: SS Mega-Monsoon

5 min	Δ < 10%	Δ < 10%			Δ < 0.1 pH		Δ < 0.3 ft	< 1L/min		< 0.5 L/min	Parameter Stabilization Limits (3 consecutive readings)
Time	**Temp (°C)**	**Conductivity (mS/cm) or (µS/cm)**	**DO (%)**	**DO (mg/L)**	**pH**	**ORP (mV)**	**Water Level (feet btoc)**	**Flow Rate (L/min) or (mL/min)**	**Turbidity (NTU)**	**Purge Volume (L) or (mL)**	**Additional Comments**
1200	26.52	0.702	120.1	9.23	8.83	71.1	47.72	300	17.1		
1205	26.04	0.664	44.5	3.56	6.63	38.0	47.73	250	29.0		
1210	26.59	0.655	30.1	2.37	6.74	26.0	47.68	250	1170		
1215	27.46	0.670	18.5	1.45	6.78	14.4	47.44	200	131.0		
1220	27.79	0.682	11.4	0.89	6.78	-7.3	47.26	300	124.0		
1225	27.73	0.686	9.7	0.76	6.78	-15.8	47.25	300	95.0		
1230											

Recorded By: W. Gunter

Jones Road Ground Water Plume Superfund Site, Houston, Harris County, Texas

Sheet ____ of ____
Date: 5/22/18

Ground Water Sampling Data Sheet

Well ID: Mw-24 | Sample ID: Mw-24 | Sample Time: 0815

Casing diameter/type: 2"
Screened interval(s): 48-53
Total depth: 55
Initial depth to water (w/o pump): 21.74
Final depth to water (w/o pump): 35.45
Measuring point: **North side of casing**

Well location: O'Reillys Parking Lot
Sampling personnel: WG/JB
Sampling method: **Low-flow micropurge**
Water level indicator: Heron
Water quality meter: YSI
Pump depth setting: 51

Weather: 85° sun Humid
Pump type/model: SS Geosub

5 min	Δ < 10%	Δ < 10%			Δ < 0.1 pH		Δ < 0.3 ft	< 1L/min		< 0.5 L/min	Parameter Stabilization Limits (3 consecutive readings)
Time	**Temp (°C)**	**Conductivity (mS/cm) or (μS/cm)**	**DO (%)**	**DO (mg/L)**	**pH**	**ORP (mV)**	**Water Level (feet btoc)**	**Flow Rate (L/min) or (mL/min)**	**Turbidity (NTU)**	**Purge Volume (L) or (mL)**	**Additional Comments**
0745	24.96	0.526	160.6	12.57	7.19	-34.4	23.49	325	27.8		Little to no
0750	24.96	0.585	32.5	2.62	7.07	-53.8	24.57	300	81.8		recharge
0755	25.15	0.591	16.6	1.36	7.04	-37.0	25.96	250	65.8		
0800	25.22	0.596	12.2	1.00	7.03	-46.3	27.64	300	48.6		
0805	25.42	0.598	10.6	0.87	7.00	-48.6	28.74	300	36.8		

Recorded By: W. Cuff

Jones Road Ground Water Plume Superfund Site, Houston, Harris County, Texas

Sheet _____ of _____
Date: 5/24/18

Ground Water Sampling Data Sheet

Well ID: Mw-25 Sample ID: Mw-25 Sample Time: /

Casing diameter/type:
Well location: Century Appliance
Weather: Clear, Hot 89°
Screened interval(s):
Sampling personnel: WG/JB
Total depth: 29.50
Sampling method: **Low-flow micropurge**
Initial depth to water (w/o pump): 29.43
Water level indicator: Heron
Final depth to water (w/o pump): 29.45
Water quality meter: YSI
Measuring point: **North side of casing**
Pump depth setting:
Pump type/model: /

5 min	Δ < 10%	Δ < 10%			Δ < 0.1 pH		Δ < 0.3 ft	< 1L/min		< 0.5 L/min	Parameter Stabilization Limits (3 consecutive readings)
Time	**Temp (°C)**	**Conductivity (mS/cm) or (μS/cm)**	**DO (%)**	**DO (mg/L)**	**pH**	**ORP (mV)**	**Water Level (feet btoc)**	**Flow Rate (L/min) or (mL/min)**	**Turbidity (NTU)**	**Purge Volume (L) or (mL)**	**Additional Comments**

No Sample

Tried to bail, could not get any water to surface

Recorded By:

Jones Road Ground Water Plume Superfund Site, Houston, Harris County, Texas

Sheet ____ of ____
Date: 11/7/18

Ground Water Sampling Data Sheet

Well ID: MW-01 | Sample ID: | Sample Time: 1040

Casing diameter/type: 2"
Well location: Halal Market
Weather: Clouds 80°
Screened interval(s): 25-35
Sampling personnel: WG/OP
Total depth: 35
Sampling method: **Low-flow micropurge**
Initial depth to water (w/o pump): 21.35
Water level indicator: Heron
Final depth to water (w/o pump): 23.08
Water quality meter: YSI
Measuring point: **North side of casing**
Pump depth setting: 28.5
Pump type/model: Monsoon

5 min	Δ < 10%	Δ < 10%			Δ < 0.1 pH		Δ < 0.3 ft	< 1L/min		< 0.5 L/min	Parameter Stabilization Limits (3 consecutive readings)
Time	**Temp (°C)**	**Conductivity (mS/cm) or (µS/cm)**	**DO (%)**	**DO (mg/L)**	**pH**	**ORP (mV)**	**Water Level (feet btoc)**	**Flow Rate (L/min) or (mL/min)**	**Turbidity (NTU)**	**Purge Volume (L) or (mL)**	**Additional Comments**
1018	24.42	1.537	102.8	7.79	6.68	-125.5	21.96	400	13.3		
1021	25.16	1.560	10.3	0.82	6.63	-134.6	21.50	200	11.6		
1024	25.70	1.579	5.5	0.49	6.61	-135.5	21.92	280	11.0		
1027	25.63	1.576	4.0	0.32	6.61	-132.4	22.10	280	10.40		
1030	25.54	1.570	3.7	0.30	6.61	-135.3	22.20	280	9.63		
1033	25.46	1.566	3.2	0.26	6.60	-136.9	22.35	300	7.63		
1036	25.45	1.563	2.8	0.23	6.60	-139.0		300	7.55		

Recorded By: WG

Jones Road Ground Water Plume Superfund Site, Houston, Harris County, Texas

Sheet ____ of ____
Date: 11/7/18

Ground Water Sampling Data Sheet

Well ID: Mw-02 Sample ID: Sample Time: 0945

Casing diameter/type: 2" Well location: Jones Rd Weather: Cloudy 80°

Screened interval(s): 2.5-35 Sampling personnel: WG/OJ

Total depth: 35 Sampling method: **Low-flow micropurge**

Initial depth to water (w/o pump): 18.20 Water level indicator: Heron

Final depth to water (w/o pump): 20.12 Water quality meter: YSI

Measuring point: **North side of casing** Pump depth setting: 26.5 Pump type/model: Monsoon

5 min	Δ < 10%	Δ < 10%			Δ < 0.1 pH		Δ < 0.3 ft	< 1L/min		< 0.5 L/min	Parameter Stabilization Limits (3 consecutive readings)
Time	**Temp (°C)**	**Conductivity (mS/cm) or (µS/cm)**	**DO (%)**	**DO (mg/L)**	**pH**	**ORP (mV)**	**Water Level (feet btoc)**	**Flow Rate (L/min) or (mL/min)**	**Turbidity (NTU)**	**Purge Volume (L) or (mL)**	**Additional Comments**
0928	23.77	1.559	63.1	5.14	7.01	18.5	19.1	200	15.8		
0931	23.10	1.559	13.3	1.11	6.89	8.3	19.21	240	31.6		
0933	23.49	1.570	6.5	0.54	6.87	3.9	19.30	200	29.1		
0936	23.54	1.566	5.0	0.42	6.85	-1.6	19.41	240	23.3		
0939	23.59	1.561	4.6	0.39	6.85	-7.6	19.51	300	19.9		
0942	23.64	1.551	4.2	0.35	6.84	-13.6	19.50	300	19.9		

Recorded By: WG

Jones Road Ground Water Plume Superfund Site, Houston, Harris County, Texas

Sheet _____ of _____
Date: 11/6/18

Ground Water Sampling Data Sheet

Well ID: Mw-03 | Sample ID: | Sample Time: 1310

Casing diameter/type: 2"
Well location: Behind Mehong
Weather: Clouds 80°
Screened interval(s): 25 - 35
Sampling personnel: WG / DT
Total depth: 35
Sampling method: **Low-flow micropurge**
Initial depth to water (w/o pump): 16.43
Water level indicator: Heron
Final depth to water (w/o pump): 16.64
Water quality meter: YSI
Measuring point: **North side of casing**
Pump depth setting: 26.5
Pump type/model: Monsoon

5 min	Δ < 10%	Δ < 10%			Δ < 0.1 pH		Δ < 0.3 ft	< 1L/min		< 0.5 L/min	Parameter Stabilization Limits (3 consecutive readings)
Time	**Temp (°C)**	**Conductivity (mS/cm) or (µS/cm)**	**DO (%)**	**DO (mg/L)**	**pH**	**ORP (mV)**	**Water Level (feet btoc)**	**Flow Rate (L/min) or (mL/min)**	**Turbidity (NTU)**	**Purge Volume (L) or (mL)**	**Additional Comments**
1248	21.96	0.982	40.7	3.43	7.08	-85.6	16.78	300	3193 av		
1251	22.13	0.945	8.6	0.74	6.83	-82.7	16.78	300	1558 av		
1254	22.50	0.937	6.3	0.54	6.72	-63.7	16.78	300	782		
1257	22.43	0.931	6.4	0.55	6.68	-57.5	16.79	300	600		
1300	22.15	0.918	6.7	0.58	6.67	-51.4	16.78	200	80		
1303	22.44	0.918	7.0	0.60	6.64	-46.1	16.78	300	38		

Recorded By: W.G

Jones Road Ground Water Plume Superfund Site, Houston, Harris County, Texas

Sheet _____ of _____
Date: 11/6/18

Ground Water Sampling Data Sheet

Well ID: Mw-04 | Sample ID: | Sample Time: 1400

Casing diameter/type: 2" | Well location: Behind Melony | Weather: Clouds 80°

Screened interval(s): 2-35 | Sampling personnel: WG / DJ

Total depth: 35 | Sampling method: **Low-flow micropurge**

Initial depth to water (w/o pump): 15.66 | Water level indicator: Heron

Final depth to water (w/o pump): 15.63 | Water quality meter: YSI

Measuring point: **North side of casing** | Pump depth setting: 25.0 | Pump type/model: Monsoon

Time	Temp (°C)	Conductivity (mS/cm) or (µS/cm)	DO (%)	DO (mg/L)	pH	ORP (mV)	Water Level (feet btoc)	Flow Rate (L/min) or (mL/min)	Turbidity (NTU)	Purge Volume (L) or (mL)	Additional Comments
5 min	Δ < 10%	Δ < 10%			Δ < 0.1 pH		Δ < 0.3 ft	< 1L/min		< 0.5 L/min	Parameter Stabilization Limits (3 consecutive readings)
1343	21.51	2.417	111.6	9.15	6.77	-128.3	/	300	29.3		WLM Issues
1346	21.20	2.404	11.0	0.95	6.73	-155.1	/	200	27.5		
1349	21.43	2.419	3.8	0.32	6.70	-160.6	17.87	300	19.3		
1352	21.70	2.434	2.7	0.23	6.68	-162.9	17.87	300	18.1		
1355	21.87	2.446	2.3	0.20	6.68	-165.7	17.85	320	18.0		
1358	21.66	2.436	2.2	0.19	6.68	-162.1	17.80	280	17.3		

Recorded By: WG

Jones Road Ground Water Plume Superfund Site, Houston, Harris County, Texas

Sheet ____ of ____
Date: 11/15/18

Ground Water Sampling Data Sheet

Well ID: Mw-05 Sample ID: Mw-05 Sample Time: 1600

Casing diameter/type: 2"
Screened interval(s): 2-35
Total depth: 35
Initial depth to water (w/o pump): 16.20
Final depth to water (w/o pump): 16.36
Measuring point: **North side of casing**

Well location: Behind Medow
Sampling personnel: WG/DT
Sampling method: **Low-flow micropurge**
Water level indicator: Heron
Water quality meter: YSI
Pump depth setting: 28.0

Weather: 80° cloudy
Pump type/model: Monsoon

5 min	Δ < 10%	Δ < 10%			Δ < 0.1 pH		Δ < 0.3 ft	< 1L/min		< 0.5 L/min	Parameter Stabilization Limits (3 consecutive readings)
Time	**Temp (°C)**	**Conductivity (mS/cm) or (µS/cm)**	**DO (%)**	**DO (mg/L)**	**pH**	**ORP (mV)**	**Water Level (feet btoc)**	**Flow Rate (L/min) or (mL/min)**	**Turbidity (NTU)**	**Purge Volume (L) or (mL)**	**Additional Comments**
1540	21.56	1.106	144.1	10.49	6.76	-18.9	16.44	350			
1543	21.58	1.090	27.4	2.37	6.65	-15.4	16.53	300			
1546	21.57	1.080	25.8	2.25	6.59	-12.6	16.55	300			
1549	21.55	1.071	22.1	1.94	6.56	-12.6	16.60	300			
1552	21.59	1.065	21.1	1.85	6.54	-10.8	16.60	300			
1555	21.63	1.058	20.7	1.82	6.53	-9.8	16.60	300			

Recorded By: W.G

Jones Road Ground Water Plume Superfund Site, Houston, Harris County, Texas

Sheet ____ of ____
Date: 11/6/18

Ground Water Sampling Data Sheet

Well ID: MW 06 Sample ID: Sample Time: 1045

Casing diameter/type: 2" Well location: Weather: 80° Overcast

Screened interval(s): 2-35 Sampling personnel: WB/OT

Total depth: 35 Sampling method: **Low-flow micropurge**

Initial depth to water (w/o pump): 30.71 Water level indicator: Solinst Heron

Final depth to water (w/o pump): 34.84 Water quality meter: YSI

Measuring point: **North side of casing** Pump depth setting: / Pump type/model: /

5 min	Δ < 10%	Δ < 10%			Δ < 0.1 pH		Δ < 0.3 ft	< 1L/min		< 0.5 L/min	Parameter Stabilization Limits (3 consecutive readings)
Time	**Temp (°C)**	**Conductivity (mS/cm) or (μS/cm)**	**DO (%)**	**DO (mg/L)**	**pH**	**ORP (mV)**	**Water Level (feet btoc)**	**Flow Rate (L/min) or (mL/min)**	**Turbidity (NTU)**	**Purge Volume (L) or (mL)**	**Additional Comments**
											Bailer

Recorded By: WB

Jones Road Ground Water Plume Superfund Site, Houston, Harris County, Texas

Sheet _____ of _____
Date: 11/5/18

Ground Water Sampling Data Sheet

Well ID: Mw-07 **Sample ID:** **Sample Time:** 1520

Casing diameter/type: 2"
Well location: Tireshop P-Lot
Weather: Cloudy 80°
Screened interval(s): 20-35
Sampling personnel: WB/OT
Total depth: 35
Sampling method: **Low-flow micropurge**
Initial depth to water (w/o pump): 26.29
Water level indicator: Heron
Final depth to water (w/o pump): 26.51
Water quality meter: YSI
Measuring point: **North side of casing**
Pump depth setting: /
Pump type/model: /

5 min	Δ < 10%	Δ < 10%			Δ < 0.1 pH		Δ < 0.3 ft	< 1L/min		< 0.5 L/min	Parameter Stabilization Limits (3 consecutive readings)
Time	**Temp (°C)**	**Conductivity (mS/cm) or (µS/cm)**	**DO (%)**	**DO (mg/L)**	**pH**	**ORP (mV)**	**Water Level (feet btoc)**	**Flow Rate (L/min) or (mL/min)**	**Turbidity (NTU)**	**Purge Volume (L) or (mL)**	**Additional Comments**
											Bail

Recorded By: WB

Jones Rd Ground Water Plume Superfund Site
Harris County, Texas

Sheet _____ of _____
Date: 11/5/18

Low-Flow Ground Water Sampling Data Sheet

Well ID: MW-08 **Sample ID:** **Sample Time:**

Casing diameter/type:
Screened interval(s):
Total depth:
Initial depth to water (w/o pump):
Final depth to water (w/o pump):
Measuring point: **North side of casing**

Well location:
Sampling personnel:
Sampling method:
Water level indicator:
Water quality meter: YSI
Pump depth setting:

Weather:
Pump type/model:

	Δ < 1° C	Δ < 3%	Δ <10%	Δ <10%	Δ < 0.1 pH	Δ < 10 mV	Δ < 0.3 ft	< 1L/min	Δ < 10 NTU		Parameter Stabilization Limits (3 consecutive readings)
Time	**Temp (°C)**	**Conductivity (mS/cm)** or **(µS/cm)**	**DO (%)**	**DO (mg/L)**	**pH**	**ORP (mV)**	**Water Level (feet btoc)**	**Flow Rate (L/min)** or **(mL/min)**	**Turbidity (NTU)**	**Purge Volume (L)** or **(mL)**	**Additional Comments**
											Well is not
											accessible / has been
											covered by property
											owner

Recorded By:___________________________

Jones Road Ground Water Plume Superfund Site, Houston, Harris County, Texas

Sheet _____ of _____
Date: 11/5/18

Ground Water Sampling Data Sheet

Well ID: Mw-09 **Sample ID:** **Sample Time:** 1435

Casing diameter/type: 2"
Well location: Ace Lot
Weather: Humid 80°
Screened interval(s): 20-35
Sampling personnel: WG/DT
Total depth: 35
Sampling method: **Low-flow micropurge**
Initial depth to water (w/o pump): 20.70
Water level indicator: Heron
Final depth to water (w/o pump): 20.90
Water quality meter: YSI
Measuring point: **North side of casing**
Pump depth setting: 28
Pump type/model: SS Monsoon

5 min	Δ < 10%	Δ < 10%			Δ < 0.1 pH		Δ < 0.3 ft	< 1L/min		< 0.5 L/min	Parameter Stabilization Limits (3 consecutive readings)
Time	**Temp (°C)**	**Conductivity (mS/cm) or (µS/cm)**	**DO (%)**	**DO (mg/L)**	**pH**	**ORP (mV)**	**Water Level (feet btoc)**	**Flow Rate (L/min) or (mL/min)**	**Turbidity (NTU)**	**Purge Volume (L) or (mL)**	**Additional Comments**
1415	22.19	1.287	84.3	6.17	6.73	-59.8	21.30	350	/		
1418	22.09	1.283	11.7	0.99	6.62	-83.7	21.32	350	/		
1421	22.37	1.285	5.7	0.49	6.51	-86.5	21.00	200	/		
1424	22.47	1.261	4.3	0.37	6.47	-86.4	21.13	200	/		
1427	22.80	1.259	3.9	0.34	6.46	-86.4	21.00	200	/		
1430	23.57	1.235	3.4	0.29	6.45	-92.2	21.10	200			

Recorded By: WG

Jones Road Ground Water Plume Superfund Site, Houston, Harris County, Texas

Sheet _____ of _____
Date: 6/6/18

Ground Water Sampling Data Sheet

Well ID: Mw-30 | Sample ID: | Sample Time: 1130

Casing diameter/type: 2"
Well location: P-Lot
Weather:
Screened interval(s): 20-32.5
Sampling personnel: WG/09
Total depth: 29.63
Sampling method: **Low-flow micropurge**
Initial depth to water (w/o pump): 24.83 WG
Water level indicator: Heron
Final depth to water (w/o pump): ~~27.96~~ 24.95
Water quality meter: YSI
Measuring point: **North side of casing**
Pump depth setting: /
Pump type/model: /

5 min	Δ < 10%	Δ < 10%			Δ < 0.1 pH		Δ < 0.3 ft	< 1L/min		< 0.5 L/min	Parameter Stabilization Limits (3 consecutive readings)
Time	**Temp (°C)**	**Conductivity (mS/cm) or (µS/cm)**	**DO (%)**	**DO (mg/L)**	**pH**	**ORP (mV)**	**Water Level (feet btoc)**	**Flow Rate (L/min) or (mL/min)**	**Turbidity (NTU)**	**Purge Volume (L) or (mL)**	**Additional Comments**
											Bail

Recorded By: WG

Jones Road Ground Water Plume Superfund Site, Houston, Harris County, Texas

Sheet _____ of _____
Date: 11/7/18

Ground Water Sampling Data Sheet

Well ID: Mw-21 **Sample ID:** **Sample Time:** 0845

Casing diameter/type: 2"
Well location: Cartender
Weather: Cloudy 85°
Screened interval(s): 20-30
Sampling personnel: WG / OT
Total depth: 29.73
Sampling method: **Low-flow micropurge**
Initial depth to water (w/o pump): 23.62
Water level indicator: Heron
Final depth to water (w/o pump): 23.80
Water quality meter: YSI
Measuring point: **North side of casing**
Pump depth setting: 25
Pump type/model: Monsoon

5 min	Δ < 10%	Δ < 10%			Δ < 0.1 pH		Δ < 0.3 ft	< 1L/min		< 0.5 L/min	Parameter Stabilization Limits (3 consecutive readings)
Time	**Temp (°C)**	**Conductivity (mS/cm) or (µS/cm)**	**DO (%)**	**DO (mg/L)**	**pH**	**ORP (mV)**	**Water Level (feet btoc)**	**Flow Rate (L/min) or (mL/min)**	**Turbidity (NTU)**	**Purge Volume (L) or (mL)**	**Additional Comments**
0825	23.88	1.062	62.6	5.07	6.98	-9.7	23.95	220	41.0		
0828	24.01	1.064	15.8	1.30	6.75	-9.4	24.00	380	45.0		
0831	24.43	1.078	4.6	0.38	6.68	-14.7	23.80	200	63.3		
0834	24.88	1.099	3.6	0.29	6.67	-26.4	23.98	240	33.5		
0837	24.76	1.107	2.5	0.20	6.65	-48.4	23.95	220	~~22.0~~ WJ 21.6		
0840	24.76	1.111	2.2	0.18	6.65	-52.6	23.97	220			

Recorded By: W.G

Jones Road Ground Water Plume Superfund Site, Houston, Harris County, Texas

Sheet _____ of _____
Date: 11/6/18

Ground Water Sampling Data Sheet

Well ID: MW-22 **Sample ID:** **Sample Time:** 1000

Casing diameter/type: 2" | Well location: | Weather: Cloudy 80°

Screened interval(s): 48-53 | Sampling personnel: WE/BT

Total depth: 55 | Sampling method: **Low-flow micropurge**

Initial depth to water (w/o pump): 45.84 | Water level indicator: Heron

Final depth to water (w/o pump): 46.24 | Water quality meter: YSI

Measuring point: **North side of casing** | Pump depth setting: / | Pump type/model: /

5 min	Δ < 10%	Δ < 10%			Δ < 0.1 pH		Δ < 0.3 ft	< 1L/min		< 0.5 L/min	Parameter Stabilization Limits (3 consecutive readings)
Time	**Temp (°C)**	**Conductivity (mS/cm) or (µS/cm)**	**DO (%)**	**DO (mg/L)**	**pH**	**ORP (mV)**	**Water Level (feet btoc)**	**Flow Rate (L/min) or (mL/min)**	**Turbidity (NTU)**	**Purge Volume (L) or (mL)**	**Additional Comments**
											Bail

Recorded By: ____________________

Jones Road Ground Water Plume Superfund Site, Houston, Harris County, Texas

Sheet _____ of _____
Date: 11/5/18

Ground Water Sampling Data Sheet

Well ID: Mw-23 | Sample ID: Mw-23 | Sample Time: 1240

Casing diameter/type: 2"
Screened interval(s): 48-53
Total depth: 55
Initial depth to water (w/o pump): 44.89
Final depth to water (w/o pump): ~~34.7~~ 44.75
Measuring point: **North side of casing**

Well location: BFE Club
Sampling personnel: WG / DT
Sampling method: **Low-flow micropurge**
Water level indicator: Heron
Water quality meter: YSI
Pump depth setting: 50'

Weather: Cloudy 75°
Pump type/model: Monsoon

5 min	Δ < 10%	Δ < 10%			Δ < 0.1 pH		Δ < 0.3 ft	< 1L/min		< 0.5 L/min	Parameter Stabilization Limits (3 consecutive readings)
Time	**Temp (°C)**	**Conductivity (mS/cm) or (µS/cm)**	**DO (%)**	**DO (mg/L)**	**pH**	**ORP (mV)**	**Water Level (feet btoc)**	**Flow Rate (L/min) or (mL/min)**	**Turbidity (NTU)**	**Purge Volume (L) or (mL)**	**Additional Comments**
1210	23.85	0.795	41.1	3.32	6.65	-32.5	44.89	250	/		Turbidity meter didn't come w/ vial
1215	23.82	0.783	14.4	1.21	6.79	-35.5	46.23	250	/		
1218	24.18	0.791	12.5	1.03	6.82	-37.8	46.10	300	/		
1221	24.72	0.804	10.6	0.88	6.86	-42.0	46.02	250	/		
1224	25.20	0.815	9.6	0.78	6.90	-47.5	45.70	300	/		
1227	25.20	0.820	8.5	0.69	6.91	-48.5	45.87	300	/		
1230	24.80	0.817	8.3	0.69	6.91	-51.9	45.94	350	/		
1233	24.81	0.817	7.8	0.64	6.91	-54.5	46.12	350	/		

Recorded By: WG

Jones Road Ground Water Plume Superfund Site, Houston, Harris County, Texas

Sheet _____ of _____
Date: 11/6/18

Ground Water Sampling Data Sheet

Well ID: MW-24 | Sample ID: MW-24 | Sample Time: 0910

Casing diameter/type: 2"
Screened interval(s): 48-53
Total depth: 55
Initial depth to water (w/o pump): 17.93
Final depth to water (w/o pump): 18.68
Measuring point: **North side of casing**

Well location: Oriolly Auto
Weather: Scattered Clouds 80°
Sampling personnel: WG / DF
Sampling method: **Low-flow micropurge**
Water level indicator: Heron
Water quality meter: YSI
Pump depth setting: 51
Pump type/model: SS Monsoon

5 min	Δ < 10%	Δ < 10%			Δ < 0.1 pH		Δ < 0.3 ft	< 1L/min		< 0.5 L/min	Parameter Stabilization Limits (3 consecutive readings)
Time	**Temp (°C)**	**Conductivity (mS/cm) or (µS/cm)**	**DO (%)**	**DO (mg/L)**	**pH**	**ORP (mV)**	**Water Level (feet btoc)**	**Flow Rate (L/min) or (mL/min)**	**Turbidity (NTU)**	**Purge Volume (L) or (mL)**	**Additional Comments**
0850	23.68	0.681	40.7	3.31	7.24	-65.4	19.15	300	10.89		
0853	23.98	0.695	12.8	1.06	7.13	-74.7	19.68	200	15.7		
0856	24.36	0.701	7.4	0.61	7.10	-81.9	20.64	300	10.63		
0859	24.50	0.704	6.1	0.50	7.09	-84.3	20.89	300	10.87		
0902	24.46	0.704	5.0	0.42	7.09	-88.6	20.84	200	9.88		
0905	24.63	0.706	4.6	0.38	7.09	-91.3	20.86	200	11.01		

Recorded By: WG

GROUND WATER LEVEL DATA

Station Number:

Recorded By: DJ

Date: 04/19

Location:

Project Name: Jones Rd GW Plume

Measuring Device: Heron

Project Number: 1434229

Developing Device:

WELL NO.	TIME	CASING SIZE	CASING ELEVATION	WATER DEPTH	PSH DEPTH	WATER ELEVATION	TOTAL DEPTH	AMOUNT BAILED	OBSERVATIONS/ COMMENTS
MW-25	10:40 04/19	2"		28.15	~~29.50~~	X	29.50		
MW-24	1053	2"		16.39			54.56		
MW-23	1103	2"		45.31			54.49		
MW-07	1112	2"		27.45			35.20		
MW-21	1117	2"		25.38			29.31		
MW-06	1138	2"		32.27			35.16		Injectate
MW-22	1143	2"		48.19			54.60		
MW-20	1151	2"		26.50			29.50		
MW-05	1239	2"		16.80			35.50		
MW-04	1245	2"		13.10			33.15		
MW-03	1255	2"		17.01			35.50		
MW-08	1320	2"		15.25					
MW-09	1325	2"		24.40			37.71		
MW-02	1333	2"		19.01			34.54		
MW-01	1350	2"		21.40			34.79		-strong injectate smell

-covered in injectate

Jones Road Ground Water Plume Superfund Site, Houston, Harris County, Texas

Date: 22 APR 2016

Ground Water Sampling Data Sheet

Well ID: MW-02 | Sample ID: | Sample Time: 15:25

Casing diameter/type: 2" PVC
Well location: SHAW INDO-PAK & Jones Rd.
Weather: Sunny ~ 78° Lt. Winds.
Screened interval(s):
Sampling personnel:
Total depth: 34.54
Sampling method: Low-flow micropurge ✓
Initial depth to water (w/o pump): 17.10
Water level indicator:
Final depth to water (w/o pump): 20.70
Water quality meter: YSI Pro Plus
Measuring point: North side of casing
Pump depth setting: 31' BTOC
Pump type/model: SS. MONSOON

5 min	Δ < 10%	Δ < 10%			Δ < 0.1 pH		Δ < 0.3 ft	< 1L/min		< 0.5 L/min	Parameter Stabilization Limits (3 consecutive readings)
Time	Temp (°C)	Conductivity (mS/cm) or (µS/cm)	DO (%)	DO (mg/L)	pH	ORP (mV)	Water Level (feet btoc)	Flow Rate ~~(L/min) or~~ (mL/min)	Turbidity (NTU)	Purge Volume (L) or (mL)	Additional Comments
14:54											Pump on
14:56	24.6	0.62	2.3	0.17	6.24	-112.6	18.42	400	2198 AU	—	-Black Precipitant (PPT) & Reducing Odor.
14:59	24.8	0.62	0.5	0.06	6.08	-92.5	19.03	350	1126	—	
15:02	24.9	0.62	-0.1	---	6.00	-98.5	20.20	500	952	—	
15:05	25.1	0.63	-0.7	---	6.02	-100.4	20.75	400	627 AU	—	flow fluctuating (uncontrollably)
15:08	24.7	0.63	-0.7	---	6.04	-99.2	21.70	275	-76 NTU	—	ODD TURBIDIM READINGS
15:11	25.3	0.66	-1.2	---	6.08	-98.3	21.90	300	-67 NTU	—	10 NTU STD = 9.73 ✓
15:14	24.9	0.66	-0.9	---	6.09	-98.3	22.60	200	-73 NTU	—	
15:17	25.2	0.68	-1.2	---	6.11	-98.2	22.65	200	53.0	—	SAMPLE

Recorded By: R. Goth, GIT

Jones Road Ground Water Plume Superfund Site, Houston, Harris County, Texas

Sheet 1 of 1
Date: 22 APR 2016

Ground Water Sampling Data Sheet

Well ID: MW-03 | Sample ID: | Sample Time: 16:50

Casing diameter/type: 2" PVC
Well location: Behind MEKONG
Weather: Sunny ~ 79°
Screened interval(s):
Sampling personnel: RG & AB
Total depth: 35.5
Sampling method: Low-flow micropurge
Initial depth to water (w/o pump): 16.00
Water level indicator: Solinst
Final depth to water (w/o pump): 16.42
Water quality meter: YSI
Measuring point: North side of casing
Pump depth setting: 33.0
Pump type/model: SS Hurricane

5 min	Δ < 10%	Δ < 10%			Δ < 0.1 pH		Δ < 0.3 ft	< 1L/min		< 0.5 L/min	Parameter Stabilization Limits (3 consecutive readings)
Time	Temp (°C)	Conductivity (mS/cm) or (µS/cm)	DO (%)	DO (mg/L)	pH	ORP (mV)	Water Level (feet btoc)	Flow Rate ~~(L/min) or~~ (mL/min)	~~Turbidity (NTU)~~	Purge Volume (L) or (mL)	Additional Comments
16:37					PUMP		ON				All DTW include 7" riser
16:39	22.8	0.96	56.1	4.61	6.98	80.2	16.38	175	1377AU	—	(temp installed due to water)
16:42	22.2	0.95	44.8	3.89	6.68	85.0	16.55	450	2194AU	—	
16:45	22.3	0.95	44.8	3.89	6.66	88.3	16.52	450	723	—	
16:48	22.2	0.94	44.1	3.82	6.65	92.1	16.52	450	62NTU	—	
											SAMPLE.

Recorded By: Ryan Guth

Ground Water Sampling Data Sheet

Well ID: MW-04 Sample ID: Sample Time: 0845

Casing diameter/type: 2" PVC
Screened interval(s): 20-35'
Total depth: 33
Initial depth to water (w/o pump): 12.65
Final depth to water (w/o pump): 13.46
Measuring point: **North side of casing**

Well location: Behind Melons
Sampling personnel: DT + AB
Sampling method: Low-flow micropurge
Water level indicator: Heron
Water quality meter: YSI Pro Plus
Pump depth setting: 30'

Weather: Humid, Overcast / Rain
Pump type/model: Monsoon SS

5 min	Δ < 10%	Δ < 10%			Δ < 0.1 pH		Δ < 0.3 ft	< 1L/min		< 0.5 L/min	Parameter Stabilization Limits (3 consecutive readings)
Time	Temp (°C)	Conductivity (mS/cm) or (µS/cm)	DO (%)	DO (mg/L)	pH	ORP (mV)	Water Level (feet btoc)	Flow Rate (L/min) or (mL/min)	Turbidity (NTU)	Purge Volume (L) or (mL)	Additional Comments
0828	20.4	0.98	2.2	0.19	7.03	-0.7	13.31	300	50.7		
0831	20.5	6.98	0.5	0.03	6.65	-30.2	14.61	300	–		- Slight drawdown
0835	20.5	0.98	0.3	0.02	6.66	-37.9	14.93	300	52.1		
0838	20.5	0.98	0.2	0.00	6.67	-40.4	15.21	400	52.0		
0841	20.6	0.98	-0.4	0.00	6.69	-42.0	15.38	300	45.2		

0.75 gal purged

Recorded By: DT

Jones Road Ground Water Plume Superfund Site, Houston, Harris County, Texas

Sheet 1 of 1
Date: 04/21/16

Ground Water Sampling Data Sheet

Well ID: MW-05 Sample ID: Sample Time: 1055

Casing diameter/type: 2" PVC
Well location: Behind Shopping center
Weather: Rain / Overcast
Screened interval(s): 25.50 - 35.50
Sampling personnel: DJ + AB
Total depth: 35.50
Sampling method: Low-flow micropurge
Initial depth to water (w/o pump): 16.32
Water level indicator: Heron
Final depth to water (w/o pump): 16.60
Water quality meter: YSI Pro Plus
Measuring point: North side of casing
Pump depth setting: 30
Pump type/model: Monsoon SS

5 min	Δ < 10%	Δ < 10%			Δ < 0.1 pH		Δ < 0.3 ft	< 1L/min		< 0.5 L/min	Parameter Stabilization Limits (3 consecutive readings)
Time	Temp (°C)	Conductivity (mS/cm) or (µS/cm)	DO (%)	DO (mg/L)	pH	ORP (mV)	Water Level (feet btoc)	Flow Rate (L/min) or (mL/min)	Turbidity (NTU)	Purge Volume (L) or (mL)	Additional Comments
0933	22.1	0.392	44.9	3.87	7.35	146.6	16.68	350	653N		- muddy sized
0936	22.1	0.383	34.6	3.03	7.09	143.6	16.97	500	787A0		- slight drawdown
0939	22.1	0.375	32.2	2.79	7.10	143.2	16.98	400	45		
0942	22.2	0.373	30.3	2.61	7.11	143.2	16.77	200	41		
0945											
			- Suspended		- RAIN						
1044	21.8	0.366	26.6	2.37	7.44	177.6	16.88	400	105		
1047	21.7	0.368	28.6	2.49	7.33	174.7	16.79	150	93.8		
1050	21.8	0.369	28.9	2.53	7.23	171.9	16.89	350	69.3		
1053	22.1	0.376	27.1	2.55	7.20	168.4	16.90	200	52.3		

≈ 0.75 gal Purged

Recorded By: DJ

Jones Road Ground Water Plume Superfund Site, Houston, Harris County, Texas

Sheet 1 of 1
Date: 04/21/16

Ground Water Sampling Data Sheet

Well ID: MW-06 | Sample ID: | Sample Time: 1430

Casing diameter/type: 2" PVC
Screened interval(s): 20-35'
Total depth: 35.16
Initial depth to water (w/o pump): 26.71
Final depth to water (w/o pump): 29.80
Measuring point: North side of casing

Well location: SW site corner
Sampling personnel: DT + AB
Sampling method: Low-flow micropurge
Water level indicator: Herron
Water quality meter: YSI Pro Plus
Pump depth setting: 34'

Weather: Cloudy/Rain
Pump type/model: Monsoon 2"

Time	Temp (°C)	Conductivity (mS/cm) or (µS/cm)	DO (%)	DO (mg/L)	pH	ORP (mV)	Water Level (feet btoc)	Flow Rate (L/min) or (mL/min)	Turbidity (NTU)	Purge Volume (L) or (mL)	Additional Comments
5 min	Δ < 10%	Δ < 10%			Δ < 0.1 pH		Δ < 0.3 ft	< 1L/min		< 0.5 L/min	Parameter Stabilization Limits (3 consecutive readings)
1417	23.6	0.57	24.3	1.89	6.12	12.9	27.49	200	615N		- lots of injectate in
1420	24.3	0.58	10.7	0.89	6.10	2.2	27.80	300	35NTU		water
1423	25.1	0.53	6.2	0.51	6.10	-2.1	28.10	250	~~10.38~~	139	- Strong odor
1426	25.2	0.58	5.1	0.43	6.10	-1.3	28.42	[illegible]50	111		- very turbid, gray
1429	25.4	0.58	4.1	0.33	6.11	-0.4	28.82	400	189		10.38 - Turbidity Meter
											standard bump test
											- slight draw down/slow
											recharge

Approx ≈ 0.50 total gal purged

Recorded By: DT

Jones Road Ground Water Plume Superfund Site, Houston, Harris County, Texas

Sheet 1 of 1
Date: 04/19/16

Ground Water Sampling Data Sheet

Well ID: MW-08 | Sample ID: | Sample Time: 1500

Casing diameter/type: 2" PVC
Screened interval(s): 10-35'
Total depth: 35.58
Initial depth to water (w/o pump): 15.25
Final depth to water (w/o pump): 15.32
Measuring point: North side of casing

Well location: Wood lot
Sampling personnel: DT & AB
Sampling method: Low-flow micropurge
Water level indicator: Heron
Water quality meter: YSI Pro Plus
Pump depth setting: 32'

Weather: Overcast humid,
Pump type/model: Monsoon SS 2"

5 min	Δ < 10%	Δ < 10%			Δ < 0.1 pH		Δ < 0.3 ft	< 1L/min		< 0.5 L/min	Parameter Stabilization Limits (3 consecutive readings)
Time	Temp (°C)	Conductivity (mS/cm) or (µS/cm)	DO (%)	DO (mg/L)	pH	ORP (mV)	Water Level (feet btoc)	Flow Rate (L/min) or (mL/min)	Turbidity (NTU)	Purge Volume (L) or (mL)	Additional Comments
1444	24.3	0.79	10.6	0.84	6.91	132.9	15.30	400	716AO		-water turbid due to
1447	23.8	0.78	1.8	0.15	6.71	31.5	15.39	300	948		surface completion being
1450	23.6	0.78	1.0	0.08	6.69	16.1	15.30	200	658		destroyed. Well is under
1453	25.2	0.80	0.4	0.03	6.70	12.7	15.35	600	620		13" wood debris, no pad
1456	24.0	0.78	0.01	0.01	6.71	6.2	15.41	300	4.0		

≈10 gal purged

Recorded By: DT

Jones Road Ground Water Plume Superfund Site, Houston, Harris County, Texas

Sheet 1 of 1
Date: 04/21/16

Ground Water Sampling Data Sheet

Well ID: MW-09 | Sample ID: | Sample Time: 1305

Casing diameter/type: 2" PVC
Well location: Ace Laydown area
Weather: Overcast/wet
Screened interval(s): 20'-40'
Sampling personnel: DT + AB
Total depth: 37.71
Sampling method: Low-flow micropurge
Initial depth to water (w/o pump): 24.40
Water level indicator: Hurson
Final depth to water (w/o pump): 24.41
Water quality meter: YSI Pro Plus
Measuring point: North side of casing
Pump depth setting: 34.0'
Pump type/model: Monsoon

5 min	Δ < 10%	Δ < 10%			Δ < 0.1 pH		Δ < 0.3 ft	< 1L/min		< 0.5 L/min	Parameter Stabilization Limits (3 consecutive readings)
Time	Temp (°C)	Conductivity (mS/cm) or (µS/cm)	DO (%)	DO (mg/L)	pH	ORP (mV)	Water Level (feet btoc)	Flow Rate (L/min) or (mL/min)	Turbidity (NTU)	Purge Volume (L) or (mL)	Additional Comments
1248	21.9	0.74	23.8	2.07	7.03	190.1	24.20	-	110		
1250	22.3	0.75	22.0	1.86	6.72	193.7	24.10	150	110		
1253	22.7	0.75	19.9	1.69	6.70	191.9	24.20	300	21		
1256	23.2	0.75	23.2	1.53	6.70	193.5	24.80	500	29.8		
1259	23.0	0.74	18.3	1.53	6.70	196.7	25.00	500	68.7		

Total Purge 0.75 gal

Recorded By: DT

Jones Road Ground Water Plume Superfund Site, Houston, Harris County, Texas

Sheet 1 of 1
Date: [illegible] Apr 2015

Ground Water Sampling Data Sheet

Well ID: MW-20 Sample ID: Sample Time: 1400

Casing diameter/type: 2" PVC
Well location: Cypress
Weather: Clear, Sunny
Screened interval(s):
Sampling personnel: RG/AB
Total depth: 29.5
Sampling method: Low-flow micropurge
Initial depth to water (w/o pump): 25.35
Water level indicator: Solinst.
Final depth to water (w/o pump): 25.42
Water quality meter: YSI - Pro Plus
Measuring point: **North side of casing**
Pump depth setting: ~~28.5~~ 28.0
Pump type/model: Monsoon (Stainless Steel)

5 min	Δ < 10%	Δ < 10%			Δ < 0.1 pH		Δ < 0.3 ft	< 1L/min		< 0.5 L/min	Parameter Stabilization Limits (3 consecutive readings)
Time	**Temp (°C)**	**Conductivity (mS/cm) or ~~(µS/cm)~~**	**DO (%)**	**DO (mg/L)**	**pH**	**ORP (mV)**	**Water Level (feet btoc)**	**Flow Rate (L/min) or (mL/min)**	**Turbidity (NTU)**	**Purge Volume (L) or (mL)**	**Additional Comments**
13:30											Pump on
13:32	26.9	1.13	3.5	0.27	6.44	145.9	25.78	200	2629	—	
13:35	27.1	1.12	2.7	0.21	6.33	114.5	~~1635~~ 25.87 RG	300	1635	—	
13:38	27.6	1.13	1.1	0.08	6.29	87.1	25.85	350	132	~1gal.	Flow fluctuating
13:41	27.8	1.13	0.0	0.00	6.29	58.2	26.26	450	122	—	
13:44	27.5	1.12	-0.2	---	6.31	40.8	26.37	450	77.6	—	Key parameters stabilized

By: Ryan Guth, GIT

Ground Water Sampling Data Sheet

Well ID: MW-21 Sample ID: Sample Time: 10:55

Casing diameter/type: 2" PVC
Screened interval(s): 25-30'
Total depth: 30'
Initial depth to water (w/o pump): 24.42
Final depth to water (w/o pump): 24.46
Measuring point: North side of casing

Well location: Four Paws Store Front
Sampling personnel: AB + RG
Sampling method: Low-flow micropurge
Water level indicator: Heron
Water quality meter: YSI Pro Plus
Pump depth setting: 28'

Weather: Sunny 75°F
Pump type/model: Monsoon SS 2"

5 min	Δ < 10%	Δ < 10%			Δ < 0.1 pH		Δ < 0.3 ft	< 1L/min		< 0.5 L/min	Parameter Stabilization Limits (3 consecutive readings)
Time	Temp (°C)	Conductivity (mS/cm) or ~~(µS/cm)~~	DO (%)	DO (mg/L)	pH	ORP (mV)	Water Level (feet btoc)	Flow Rate (L/min) or (mL/min)	Turbidity (NTU)	Purge Volume (L) or (mL)	Additional Comments
10:19											Pump on
10:25	25°	1.00	2.1	0.17	6.74	194	24.90	500	63.4	—	
10:28	25.1	0.99	1.4	0.11	6.58	194.6	24.92	500	51.0	—	
10:31	25.5	0.99	0.3	0.02	6.56	196.8	24.89	400	25.7	—	
10:34	25.6	1.00	0.1	0.01	6.55	195.7	24.92	400	15.3	—	
10:37	25.5	0.99	-0.3	---	6.55	193.0	24.97	450	9.87		

Recorded By: DT / RG

Jones Road Ground Water Plume Superfund Site, Houston, Harris County, Texas

Sheet 1 of 1
Date: 04/21/16

Ground Water Sampling Data Sheet

Well ID: MW-22 | Sample ID: | Sample Time: 1535

Casing diameter/type: 2" PVC
Screened interval(s): 50-55
Total depth: 55'
Initial depth to water (w/o pump): 46.73
Final depth to water (w/o pump): 47.19
Measuring point: North side of casing

Well location: SW Corner lot
Sampling personnel: DT + AB
Sampling method: Low-flow micropurge
Water level indicator: Heron
Water quality meter: YSI Pro Plus
Pump depth setting: 52

Weather: Cloudy/Rain
Pump type/model: Monsoon SS

5 min	Δ < 10%	Δ < 10%			Δ < 0.1 pH		Δ < 0.3 ft	< 1L/min		< 0.5 L/min	Parameter Stabilization Limits (3 consecutive readings)
Time	Temp (°C)	Conductivity (mS/cm) or (µS/cm)	DO (%)	DO (mg/L)	pH	ORP (mV)	Water Level (feet btoc)	Flow Rate (L/min) or (mL/min)	Turbidity (NTU)	Purge Volume (L) or (mL)	Additional Comments
1522	24.2	1.23	12.0	0.97	6.36	-37.8	48.21	400	210.00		- water turbid
1525	24.7	1.22	2.5	0.19	6.30	-38.9	48.29	200	187 NU		- strong micro. odor
1528	25.1	1.21	1.0	0.09	6.26	-34.8	48.28	300	- over		
1531	25.7	1.19	0.4	0.03	6.21	-21.0	48.52	682	- over		
1534	25.9	1.18	0.1	0.04	6.21	-14.7	48.46	300	158.0		

Total Purge 0.75 gal

Recorded By: DT

11/25/2015

Jones Road Ground Water Plume Superfund Site, Houston, Harris County, Texas

Sheet 1 of 1
Date: 04/20/16

Ground Water Sampling Data Sheet

Well ID: MW-23 Sample ID: Sample Time: 1420

Casing diameter/type: 2" PVC
Screened interval(s): 45.0-54.49
Total depth: 54.49
Initial depth to water (w/o pump): 45.18
Final depth to water (w/o pump): 45.54
Measuring point: North side of casing

Well location: BFE lot
Sampling personnel: DT + JB
Sampling method: Low-flow micropurge
Water level indicator: Heron
Water quality meter: YSI Pro +
Pump depth setting: 52

Weather: Rain/clouds
Pump type/model: Monsoon SS

5 min	Δ < 10%	Δ < 10%			Δ < 0.1 pH		Δ < 0.3 ft	< 1L/min		< 0.5 L/min	Parameter Stabilization Limits (3 consecutive readings)
Time	Temp (°C)	Conductivity (mS/cm) or (µS/cm)	DO (%)	DO (mg/L)	pH	ORP (mV)	Water Level (feet btoc)	Flow Rate (L/min) or (mL/min)	Turbidity (NTU)	Purge Volume (L) or (mL)	Additional Comments
1405	24.6	0.61	24.5	1.83	7.01	176.0	46.35	125	OR		-water turbid
1408	24.7	0.61	6.7	0.55	6.94	169.0	46.63	325	OR		-cloudy orange
1411	25.2	0.62	4.6	0.38	6.93	159.9	46.99	250	OR		-likely injection related
1414	25.6	0.63	4.5	0.37	6.93	152.3	47.38	325	OR		-slight rancid odor
1417	25.6	0.63	4.7	0.38	6.93	144.0	47.38	300	OR		

≈ 0.75 gal Purged

Recorded By: DJ

Jones Road Ground Water Plume Superfund Site, Houston, Harris County, Texas

Sheet 1 of 1
Date: 04/20/16

Ground Water Sampling Data Sheet

Well ID: MW-24 Sample ID: Sample Time: 1205

Casing diameter/type: 2" PVC
Well location: O'Reilly Lot
Weather: Rain, 76°F

Screened interval(s): 30-35'
Sampling personnel: DT + AB

Total depth: 55.0
Sampling method: Low-flow micropurge

Initial depth to water (w/o pump): 16.41
Water level indicator: Heron

Final depth to water (w/o pump): 20.86
Water quality meter: YSI Pro Plus

Measuring point: North side of casing
Pump depth setting: 52
Pump type/model: Monsoon 2" SS

5 min	Δ < 10%	Δ < 10%			Δ < 0.1 pH		Δ < 0.3 ft	< 1L/min		< 0.5 L/min	Parameter Stabilization Limits (3 consecutive readings)
Time	Temp (°C)	Conductivity (mS/cm) or (µS/cm)	DO (%)	DO (mg/L)	pH	ORP (mV)	Water Level (feet btoc)	Flow Rate (L/min) or (mL/min)	Turbidity (NTU)	Purge Volume (L) or (mL)	Additional Comments
1149	23.7	0.259	29.2	2.4	9.45	142.2	16.45	150	~~162~~ 52.3		9.93 Cal on turbidity
1152	24.4	0.51	4.4	3.9	7.51	157.8	17.46	200	131		- slight drawdown
1155	24.4	0.53	2.9	2.9	7.11	152.4	18.19	180	28		- slow recharge, slight
1158	23.8	0.53	2.4	0.21	7.06	146.8	18.48	350	11		draw down
1201	24.4	0.54	2.5	0.21	7.04	143.3	19.66	200	92.8		
1204	24.3	0.54	2.5	0.20	7.04	137.9	20.23	200	75.4		

~0.75 gal Purge

Recorded By: DT

GROUND WATER LEVEL DATA

Station Number: ______ Recorded By: DT Date: 11/23/15 Location: ______

Project Name: Jones Rd Measuring Device: ______

Project Number: ______ Developing Device: ______

Screen Bottom

WELL NO.	TIME	CASING SIZE	CASING ELEVATION	WATER DEPTH	~~PSH DEPTH~~	WATER ELEVATION	TOTAL DEPTH	AMOUNT BAILED	OBSERVATIONS/ COMMENTS
MW01	1102	2"		25.16	35				
MW02		2"		23.21	35				
MW03		2"		22.21	35	could not locate - will check pics			
MW-04		2"		21.39	35				
MW-05		2"		22.32	35				
MW-06		2"		34.01	35				
MW-07		2"		28.68	35				
MW-08		2"		20.14	~~35~~ 35.5 cap driven over - likely full of rain water				
MW-09		2"		27.28	35				
MW-10		4"		143.72	290				
MW-11R		4"		143.38	269				
MW-12		4"		141.07	280				
MW-13		4"		141.94	296				
MW-14		4"		138.41	280				
MW-15		4"		140.18	294				

75 600 ft tubing

GROUND WATER LEVEL DATA

Station Number:________________ Recorded By: Date: Location:______________________________

Project Name:__________________ ______________________ _______ Measuring Device:_______________________

Project Number:________________ ______________________ _______ Developing Device:______________________

WELL NO.	TIME	CASING SIZE	CASING ELEVATION	WATER DEPTH	~~PSH~~ Screen Bottom DEPTH	WATER ELEVATION	TOTAL DEPTH	AMOUNT BAILED	OBSERVATIONS/ COMMENTS
MW-16		4"		140.97	278				
MW-17		4"		223.21	410				
MW-18		4"		144.18	284				
MW-19		4"		146.18	240				
MW-20		2"		27.92	30				
MW-21		2"		27.61	30				
MW-22		2"		49.52	53				
MW-23		2"		46.67	53				
MW-24		2"		20.37	53				
MW-25		2"		29.41	28		30.0		* well nearly dry
SVE-1		2"		109.64	122				
SVE-2		2"		110.33	122				
SVE-3		2"		108.85	122				
SVE-4		2"		109.84	122				
SVE-5		2"		109.58					

Jones Road Superfund Site -
Harris County, Texas

Sheet 1 of 1
Date: 12/03/15

Field Record of Well Purging and Sampling

Well ID: MW-01 Sample ID: Sample Time: 0755

Casing diameter/type: 2" PVC
Well location: Store front Medical Market
Weather: Sunny 45°F
Screened interval(s): 25-35
Sampling personnel: Duane T, John B
Total depth: 35
Sampling method: low flow micro purge
Initial depth to water (w/o pump): 25.03
Water level indicator: Heron
Final depth to water (w/o pump): 25.33
Water quality meter: YSI Pro
Measuring point: North side of casing
Pump depth setting: 30
Pump type/model: Monsoon Pro

Time	Temp (°C)	Conductiv (mS/cm) or (µS/cm)	%DO	DO (mg/L)	pH	ORP (mV)	Water Level (feet btoc)	Flow Rate (L/min) or (mL/min)	Turbidity (NTU)	Purge Volume (L) or (mL)	Additional Comments
0739	22.2	862	20.1	1.57	6.99	94.1	25.41	225	111		
0742	23.9	895	12.4	1.03	6.65	73.2	25.54	300	149		
0745	25.2	926	9.6	0.80	6.60	53.7	25.64	300	114		
1048	25.5	931	8.2	0.67	6.60	41.0	25.71	350	88.5		-slight drawdown
1051	25.8	934	7.4	0.60	6.60	21.6	25.81	350	58.9		

Recorded By: DT

Jones Road Superfund Site -
Harris County, Texas

Sheet 1 of 1
Date: 12/03/15

Field Record of Well Purging and Sampling

Well ID: MW-02 **Sample ID:** **Sample Time:** 0935

Casing diameter/type: 2" PVC
Well location: NW Corner Shopping Center lot
Weather: Sunny, 60°F
Screened interval(s): 25'- ~~35~~ 35
Sampling personnel: Duane Thomas, John Bonner
Total depth: 35'
Sampling method: low flow micro purge
Initial depth to water (w/o pump): 23.18
Water level indicator: Heron
Final depth to water (w/o pump): 23.58
Water quality meter: YSI Pro
Measuring point: **North side of casing**
Pump depth setting: 30
Pump type/model: Monsoon Pro

Time	Temp (°C)	Conductiv (mS/cm) or (µS/cm)	%DO	DO (mg/L)	pH	ORP (mV)	Water Level (feet btoc)	Flow Rate (L/min) or (mL/min)	Turbidity (NTU)	Purge Volume (L) or (mL)	Additional Comments
0914	22.3	817	31.3	2.68	6.73	148.7	24.30	225	463		
0917	22.4	847	26.8	2.31	6.72	125.6	24.35	250	464		
0920	23.5	866	27.6	2.33	6.72	110.7	24.56	250	415		
0923	23.8	875	33.0	2.82	6.72	98.6	24.72	325	229		
0926	24.0	880	34.1	2.88	6.74	90.3	24.83	275	144		
0929	23.7	878	31.5	2.63	6.74	83.7	24.82	250	104		

Recorded By: DT

Jones Road Superfund Site -
Harris County, Texas

Sheet 1 of 1
Date: 12/03/15

Field Record of Well Purging and Sampling

Well ID: MW-03 Sample ID: Sample Time: 1050

Casing diameter/type: 2" PVC
Well location: Behind Mekong Rest
Weather: Sunny 60°F
Screened interval(s): 2.5-35
Sampling personnel: Duane T. John B
Total depth: 35
Sampling method: low flow micro purge
Initial depth to water (w/o pump): 22.21
Water level indicator: Heron
Final depth to water (w/o pump): 22.23
Water quality meter: YSI Pro
Measuring point: North side of casing
Pump depth setting: 30'
Pump type/model: Monsoon Pro

Time	Temp (°C)	Conductiv (mS/cm) or (µS/cm)	%DO	DO (mg/L)	pH	ORP (mV)	Water Level (feet btoc)	Flow Rate (L/min) or (mL/min)	Turbidity (NTU)	Purge Volume (L) or (mL)	Additional Comments
1033	20.2	878	24.3	2.14	6.56	140.3	22.50	300	308		
1036	20.3	902	18.7	1.66	6.59	123.7	22.56	250	286		
1039	21.8	925	16.1	1.41	6.62	110.6	22.62	400	195		
1042	21.8	966	13.3	1.16	6.60	99.4	22.60	400	97.9		
1045	21.1	1003	11.8	1.04	6.60	91.2	22.48	250	52.5		
1048	21.2	1014	11.2	0.99	6.60	84.2	22.48	250	49.9		

In Used purge

Recorded By: DT

Jones Road Superfund Site -
Harris County, Texas

Sheet 1 of 1
Date: 12/02/15

Field Record of Well Purging and Sampling

Well ID: MW-04 **Sample ID:** **Sample Time:** 1355

Casing diameter/type: 2" PVC
Well location: Behind Center at N treeline
Weather: Partly sunny 65°F
Screened interval(s): 2-35'
Sampling personnel: Duane T, John B
Total depth: 35'
Sampling method: Low flow micropurge
Initial depth to water (w/o pump): 21.63
Water level indicator: Heron
Final depth to water (w/o pump):
Water quality meter: YSI PRO
Measuring point: **North side of casing**
Pump depth setting: ~~30~~ 29'
Pump type/model: Monsoon Pro

Time	Temp (°C)	Conductiv (mS/cm) or (µS/cm)	%DO	DO (mg/L)	pH	ORP (mV)	Water Level (feet btoc)	Flow Rate (L/min) or (mL/min)	Turbidity (NTU)	Purge Volume (L) or (mL)	Additional Comments
1335	20.8	1495	24.8	2.17	7.04	-123.9	22.80	275	917		-removed mud plug
1338	21.6	1483	10.5	0.90	6.80	-171.7	23.10	375	242		-well had no lid, or no tight
1341	21.5	1463	9.7	0.85	6.77	-181.6	22.95	225	264		lid and was buried in mud
1344	21.5	1470	8.9	0.78	6.75	-186.2	22.95	275	193		-cleared mud plug
1347	21.7	1477	8.0	0.70	6.74	-189.1	22.98	275	118		-water very turbid.
1350	21.8	1478	7.6	0.67	6.74	-191.6	22.98	250	74.7		

~1.5 gal purged
(purged agitated water
from surging)

Recorded By: DT

Jones Road Superfund Site -
Harris County, Texas

Sheet 1 of 1
Date: 12/02/15

Field Record of Well Purging and Sampling

Well ID: MW-05 Sample ID: Sample Time: 1140

Casing diameter/type: 2" PVC
Well location: Behind Shopping Center
Weather: Cloudy ~60°F
Screened interval(s): 2'-35
Sampling personnel: Duane T. John B.
Total depth: 35.5'
Sampling method: low flow micropurge
Initial depth to water (w/o pump): 22.50
Water level indicator: Heron
Final depth to water (w/o pump): 22.64
Water quality meter: YSI Pro
Measuring point: North side of casing
Pump depth setting: 29
Pump type/model: Monsoon Pro

Time	Temp (°C)	Conductiv (mS/cm) or (µS/cm)	%DO	DO (mg/L)	pH	ORP (mV)	Water Level (feet btoc)	Flow Rate (L/min) or (mL/min)	Turbidity (NTU)	Purge Volume (L) or (mL)	Additional Comments
1123	21.9	1077	10.0	0.88	6.64	19.2	22.89	425	OR		-High turbidity
1126	22.2	1084	11.9	1.02	6.58	-1.2	22.79	200	OR		
1129	22.6	1081	9.6	0.82	6.58	-29.4	22.94	250	828		
1132	22.6	1076	9.1	0.82	6.59	-56.4	22.94	350	456		
1135	22.8	1078	8.8	0.76	6.59	-73.6	22.98	300	292		
1138	22.7	1075	8.4	0.72	6.60	-95.7	22.90	125	148		

Tl purge 0.58 gal

Recorded By: DT

Jones Road Superfund Site -
Harris County, Texas

Sheet 1 of 1
Date: 11/30/15

Field Record of Well Purging and Sampling

Well ID: MW-2e **Sample ID:** **Sample Time:**

Casing diameter/type: 2" PVC
Well location: SW Corner lot
Weather: Cloudy 50°F
Screened interval(s): 2-35'
Sampling personnel: John Bonner, Duane T
Total depth: 35'
Sampling method: Low Flow micropurge
Initial depth to water (w/o pump): 33.76
Water level indicator: Heron
Final depth to water (w/o pump):
Water quality meter: YSI Pro+
Measuring point: **North side of casing**
Pump depth setting: 34.5
Pump type/model: SS Monsoon

Time	Temp (°C)	Conductiv (mS/cm) or (µS/cm)	%DO	DO (mg/L)	pH	ORP (mV)	Water Level (feet btoc)	Flow Rate (L/min) or (mL/min)	Turbidity (NTU)	Purge Volume (L) or (mL)	Additional Comments
											X Very low water
											level may not
											low flow

* LOW FLOW NOT POSSIBLE
- no water from well, from pump
- will try grab with bailer 12/01
- will bail dry, sample 12/01

Recorded By: DT

Jones Road Superfund Site -
Harris County, Texas

Sheet 1 of 1
Date: 4/01/15

Field Record of Well Purging and Sampling

Well ID: MW-07 **Sample ID:** **Sample Time:**

Casing diameter/type: 2" PVC
Well location: BFE lot
Weather: Rain, 50°F
Screened interval(s): 20-35'
Sampling personnel: Duane Thomas, John B
Total depth: 35'
Sampling method: low flow micropump
Initial depth to water (w/o pump): 28.43
Water level indicator: Heron
Final depth to water (w/o pump):
Water quality meter: YSI Pro
Measuring point: **North side of casing**
Pump depth setting: 31'
Pump type/model: Pro Monsoon

Time	Temp (°C)	Conductiv (mS/cm) or (µS/cm)	%DO	DO (mg/L)	pH	ORP (mV)	Water Level (feet btoc)	Flow Rate (L/min) or (mL/min)	Turbidity (NTU)	Purge Volume (L) or (mL)	Additional Comments

* Casing Bent. Will not allow 2" bailer or 2" pump
will try pencil bailer or peristaltic
later in the week.

Recorded By: DT

Jones Road Superfund Site -
Harris County, Texas

Sheet 1 of 1
Date: 12/02/15

Field Record of Well Purging and Sampling

Well ID: MW-08 **Sample ID:** **Sample Time:** 1025

Casing diameter/type: 2" PVC
Well location: BBQ Wood
Weather: Partly Cloudy 60°
Screened interval(s): 20.5 - 35.5
Sampling personnel: Duane Thomas
Total depth: 36.5
Sampling method: Low flow micropurge
Initial depth to water (w/o pump): 20.12
Water level indicator: Heron
Final depth to water (w/o pump): 20.22
Water quality meter: YSI Pro
Measuring point: **North side of casing**
Pump depth setting: 25'
Pump type/model: Monsoon Pro

Time	Temp (°C)	Conductiv (mS/cm) or (µS/cm)	%DO	DO (mg/L)	pH	ORP (mV)	Water Level (feet btoc)	Flow Rate (L/min) or (mL/min)	Turbidity (NTU)	Purge Volume (L) or (mL)	Additional Comments
1005	22.3	388.7	12.1	1.01	7.08	-87.0	20.50	300	565		- water filled with
1008	23.0	405.3	8.6	0.72	7.18	-117.0	20.65	400	698		debris
1011	23.2	414.0	7.6	0.65	7.18	-126.4	20.55	250	451		- odor of mud & debris
1014	23.1	433.1	7.2	0.62	7.05	-141.9	20.59	300	298		from filling during
1017	23.4	462.1	6.9	0.58	7.16	-147.4	20.60	425	198		destruction
1020	23.5	476.2	6.8	0.58	7.07	-140.0	20.74	425	158		- turbidity clearing
1023	23.4	493.7	6.6	0.56	7.07	-137.5	21.0	425	109		

≈ 1.0 gal purged

Recorded By: DT

Jones Road Superfund Site -
Harris County, Texas

Sheet 1 of 1
Date: 12

Field Record of Well Purging and Sampling

Well ID: MW-09 **Sample ID:** **Sample Time:** 0915

Casing diameter/type: 2" PVC
Well location: Ace South lot
Weather: Partly Cloudy 60°F
Screened interval(s): 20-35
Sampling personnel: Duane Thomas
Total depth: 35
Sampling method: low flow micropurge
Initial depth to water (w/o pump): 26.96
Water level indicator: Heron
Final depth to water (w/o pump): 27.74
Water quality meter: YSI PRO
Measuring point: **North side of casing**
Pump depth setting: 30'
Pump type/model: Monsoon Pro

Time	Temp (°C)	Conductiv (mS/cm) or (µS/cm)	%DO	DO (mg/L)	pH	ORP (mV)	Water Level (feet btoc)	Flow Rate (L/min) or (mL/min)	Turbidity (NTU)	Purge Volume (L) or (mL)	Additional Comments
0857 ~~20.0~~	19.9	673	26.5	2.53	6.92	160.9	28.19	250	300		-water slightly turbid
0900	20.6	691	24.9	2.23	6.71	156.1	27.91	200	272		
0903	21.3	698	22.4	1.98	6.66	152.6	28.13	200	367		
0906	21.3	702	21.2	1.88	6.65	150.0	28.19	200	315		
0909	22.1	710	19.7	1.70	6.65	147.2	28.20	200	258		
0912	22.1	712	18.5	1.60	6.65	143.6	28.25	175	184		

≈ 0.5 gal Purged

Recorded By: DT

Jones Road Superfund Site -
Harris County, Texas

Sheet 1 of 1
Date: 12/02/15

Field Record of Well Purging and Sampling

Well ID: MW-20 **Sample ID:** **Sample Time:**

Casing diameter/type: 2" PVC
Well location: Center West Main lot
Weather: Partly Cloudy
Screened interval(s): 25-30
Sampling personnel: Duane Thomas, John B
Total depth: 32'
Sampling method: low flow micro purge
Initial depth to water (w/o pump): 27.73
Water level indicator: Heron
Final depth to water (w/o pump):
Water quality meter: YSI Pro
Measuring point: **North side of casing**
Pump depth setting:
Pump type/model: Monsoon Pro

Time	Temp (°C)	Conductiv (mS/cm) or (µS/cm)	%DO	DO (mg/L)	pH	ORP (mV)	Water Level (feet btoc)	Flow Rate (L/min) or (mL/min)	Turbidity (NTU)	Purge Volume (L) or (mL)	Additional Comments
											*only 2.23' of water
											-water extremely turbid

MW-20 Will not
low flow - not enough water
will bail dry then sample
-water basically mud

Recorded By: DT

Jones Road Superfund Site -
Harris County, Texas

Sheet 1 of 1
Date:

Field Record of Well Purging and Sampling

Well ID: MW-21   Sample ID: Sample Time: 1335

Casing diameter/type: 2" PVC   Well location: Storefront, Cave Level   Weather: Cloudy, cool - 50°
Screened interval(s): 25-30   Sampling personnel: Diane T, John B
Total depth: 32'   Sampling method: Low flow micro purge
Initial depth to water (w/o pump): 27.49   Water level indicator: Heron
Final depth to water (w/o pump): 27.76   Water quality meter: YSI Pro
Measuring point: **North side of casing**   Pump depth setting: 29'   Pump type/model: Monsoon Pro

Time	Temp (°C)	Conductiv (mS/cm) or (µS/cm)	%DO	DO (mg/L)	pH	ORP (mV)	Water Level (feet btoc)	Flow Rate (L/min) or (mL/min)	Turbidity (NTU)	Purge Volume (L) or (mL)	Additional Comments
1321	23.7	1086	14.0	1.17	6.60	259.7	28.55	150	OR		-water turbid
1324	23.9	1097	15.1	1.26	6.50	239.1	28.42	150	OR		-very fine particles
1327	23.3	1084	14.3	1.22	6.51	228.1	28.21	150	OR		
1330	25.9	1147	11.9	0.97	6.52	211.5	29.00	350	OR		
1333	26.2	1154	10.0	0.80	6.52	202.1	29.00	150	OR		-probe on pump

≈ 0.5 gal / purged

Recorded By: DT

Jones Road Superfund Site -
Harris County, Texas

Sheet 1 of 1
Date: 11/30/15

Field Record of Well Purging and Sampling

Well ID: MW-22 | Sample ID: | Sample Time: 1358

Casing diameter/type: 2" PVC | Well location: SW Corner Cypress | Weather: Cloudy 50°

Screened interval(s): | Sampling personnel: Duane Thomas, John Bonner

Total depth: 55.50 | Sampling method: Low flow micropurge

Initial depth to water (w/o pump): 49.34 | Water level indicator: Heron

Final depth to water (w/o pump): ~~55.50~~ 49.40 | Water quality meter: YSI Pro

Measuring point: **North side of casing** | Pump depth setting: 53' | Pump type/model: Monsoon Pro

Time	Temp (°C)	Conductiv (mS/cm) or (µS/cm)	%DO	DO (mg/L)	pH	ORP (mV)	Water Level (feet btoc)	Flow Rate (L/min) or (mL/min)	Turbidity (NTU)	Purge Volume (L) or (mL)	Additional Comments
1334	22.9	1030	43.2	3.41	6.46	196.9	.	325	26.9		* Water levels low
1337	24.4	1089	21.4	1.75	6.43	186.6	50.98	275	319		≈ 6' of water in well
1340	24.2	1089	13.2	1.10	6.45	178.0	50.71	225	946		- water turbid, check
1343	24.5	1094	11.3	0.95	6.46	172.4	50.49	200	OVER		blank 10.3 NTU
1346	24.1	1085	10.90	0.91	6.47	166.0	49.70	175	949		- very fine particles in
1349	23.9	1082	10.28	0.86	6.47	162.5	49.75	250	OVER		- raising pump to see if
1352	24.5	1096	9.5	0.78	6.47	156.5	49.75	150	OVER		turbidity clears
1355	24.6	1091	9.2	0.77	6.48	139.0	49.89	300	OVER		- super fine particles,
											pump pulled to 51'

~ 3.0 Liters Purged

Recorded By: DT

Jones Road Superfund Site -
Harris County, Texas

Sheet 1 of 1
Date: 12/01/15

Field Record of Well Purging and Sampling

Well ID: MW23 Sample ID: Sample Time: 0845

Casing diameter/type: 2" PVC
Well location: BFE Lot
Weather: Rain, 50°F
Screened interval(s): 48-53'
Sampling personnel: Duane T & John B
Total depth: 55'
Sampling method: Low Flow Micropurge
Initial depth to water (w/o pump): ~~48.19~~ 46.42
Water level indicator: Heron
Final depth to water (w/o pump): 46.42
Water quality meter: YSI Pro
Measuring point: North side of casing
Pump depth setting: 50.5
Pump type/model: 35 Monsoon Pro

Time	Temp (°C)	Conductiv (mS/cm) or (uS/cm)	%DO	DO (mg/L)	pH	ORP (mV)	Water Level (feet btoc)	Flow Rate (L/min) or (mL/min)	Turbidity (NTU)	Purge Volume (L) or (mL)	Additional Comments
0832	23.5	617	21.9	1.58	6.81	6.81	48.01	205	29.6		
0835	22.5	620	17.7	1.54	6.78	-1796.4	47.80	2387	33.4		-orp seems to be affected by injectate
0838	23.0	630	15.8	1.34	6.78	-1326.7	47.63	205	161		
0841	22.2	622	15.4	1.34	6.79	-1884.8	47.40	150	192		
0844	22.2	634	15.1	1.29	6.79	-1860.7	47.35	100	158		

Purge ≈ 1 gal

well de

Recorded By: DT

Jones Road Superfund Site -
Harris County, Texas

Sheet 1 of 1
Date: 12/01/15

Field Record of Well Purging and Sampling

Well ID: MW-24 **Sample ID:** **Sample Time:** 1010

Casing diameter/type: 2" PVC
Well location: O'Reilly Lot
Weather: Rain, clouds 50° F
Screened interval(s): 48-53
Sampling personnel: John Borner, Duane T
Total depth: 55
Sampling method: Low flow micropurge
Initial depth to water (w/o pump): 9.81
Water level indicator: Herron
Final depth to water (w/o pump): 21.74
Water quality meter: YSI Pro
Measuring point: **North side of casing**
Pump depth setting: 50.5'
Pump type/model: Monsoon Pro

Time	Temp (°C)	Conductiv (mS/cm) or (µS/cm)	%DO	DO (mg/L)	pH	ORP (mV)	Water Level (feet btoc)	Flow Rate (L/min) or (mL/min)	Turbidity (NTU)	Purge Volume (L) or (mL)	Additional Comments
0953	22.3	388.3	205	1.78	8.42	251.6	20.48	200	41.4		~slight drawdown
0956	22.6	533	16.5	1.39	7.18	236.8	21.10	250	48.8		
0959	21.8	528	15.8	1.34	7.12	230.4	21.75	350	65.9		
1002	23.9	546	12.9	1.07	7.11	224.4	22.01	200	53.5		
1005	23.3	521	12.1	1.03	7.19	214.6	22.70	200	33.8		

Purge 0.5 gal

Recorded By: DT

Jones Road Superfund Site - Supplemental RI/FS
Harris County, Texas

Sheet 1 of 1
Date: 09/20/2016

Field Record of Well Purging and Sampling

Well ID: MW-01 **Sample ID:** MW-01 MW-01 - Dup **Sample Time:** 08 34

Casing diameter/type: 2inch PVC
Well location: Cypress Centre
Weather: 77° Sunny
Screened interval(s): 2 - 35
Sampling personnel: Maria B. ; Jonh B.
Total depth: 34.79
Sampling method: Low - Flow
Initial depth to water (w/o pump): 23.49
Water level indicator: slipper - T
Final depth to water (w/o pump): 24.1
Water quality meter: YSI
Measuring point: **North side of casing**
Pump depth setting: 29.14
Pump type/model: Geo pump Monsoon

Time	Temp (°C)	Conductiv (mS/cm) or (µS/cm)	%DO	DO (mg/L)	pH	ORP (mV)	Water Level (feet btoc)	Flow Rate (L/min) or (mL/min)	Turbidity (NTU)	Purge Volume (L) or (mL)	Additional Comments
08 15											Pump on
08 17	25.55	2.329	46.2	3.65	6.19	-103.1	24.65	300	61.3	500 mL	
08 20	25.89	2.345	27.0	2.14	6.22	-115.7	24.81	200	61.8	750 mL	
08 23	26.38	2.389	22.0	1.75	6.25	-115.6	25.12	200	58.7	1.0 L	
08 26	26.45	2.400	18.7	1.50	6.27	-115.9	25.13	225 mL/min	57.7	1.5 L	
08 29	26.80	2.426	17.8	1.40	6.28	-119.8	25.33	250 mL/min	46.0	3.0 L	
											Final Water Level = 25.61

Recorded By: Maria Briano

Sheet 1 of 1
Date: 09/20/2016

Field Record of Well Purging and Sampling

Well ID: MW-02 **Sample ID:** MW-02 **Sample Time:** 11 54

Casing diameter/type: PVC 2inch
Well location: Cypress Centre
Weather: 90° Sunny
Screened interval(s): 2-35
Sampling personnel: Maria B. ; John B.
Total depth: 34.54
Sampling method: Low-Flow
Initial depth to water (w/o pump): 21.81
Water level indicator: dipper-T
Final depth to water (w/o pump): 22.73
Water quality meter: YSI
Measuring point: **North side of casing**
Pump depth setting: 28.18
Pump type/model: Monsoon

Time	Temp (°C)	Conductiv (mS/cm) or (µS/cm)	%DO	DO (mg/L)	pH	ORP (mV)	Water Level (feet btoc)	Flow Rate (L/min) or (mL/min)	Turbidity (NTU)	Purge Volume (L) or (mL)	Additional Comments
11 32											Pump - on
11 33	27.37	1.612	121.4	9.34	5.29	-94.1	23.32	150mL	175	150 mL	
11 36	27.08	1.599	84.1	6.68	4.87	-78.7	24.21	200mL	260	450 mL	
11 39	26.27	1.565	72.5	5.77	4.53	-70	25.29	200mL	220	750 mL	
11 42	26.86	1.583	56.7	4.52	4.55	-72.2	25.30	225mL	201	1 L	Water had a dark
11 45	26.80	1.585	52.0	4.16	4.56	-73.9	25.55	250mL	120	1.5 L	color
11 48	25.90	1.565	48.0	3.87	4.37	-70.3	25.93	250mL	86	2.50L	
11 51	25.68	1.557	44.5	3.61	4.32	-61.0	26.02	300mL	82.6	3.50L	

Recorded By: Maria Briceno

Jones Road Superfund Site - Supplemental RI/FS
Harris County, Texas

Sheet 1 of ___
Date: ~~09/21/2016~~

Field Record of Well Purging and Sampling

Well ID: MW-03 **Sample ID:** MW-03 **Sample Time:** 1012

Casing diameter/type: 2inch PVC
Well location: Behind Cypress Centre
Weather: 85° Sunny
Screened interval(s): 2.5-35
Sampling personnel: Maria B. ; John B.
Total depth: 35
Sampling method: low Flow
Initial depth to water (w/o pump): 20.73
Water level indicator: dipper-T
Final depth to water (w/o pump): 21.3
Water quality meter: YSI
Measuring point: **North side of casing**
Pump depth setting: ~~18.75~~ MB 27.5
Pump type/model: Monsoon

Time	Temp (°C)	Conductiv (mS/cm) or (µS/cm)	%DO	DO (mg/L)	pH	ORP (mV)	Water Level (feet btoc)	Flow Rate (L/min) or (mL/min)	Turbidity (NTU)	Purge Volume (L) or (mL)	Additional Comments
09 49											Pump on
09 51	23.14	0.622	24.4	2.09	5.80	5.5	21.13	300	41.5	600mL	
09 54	22.64	0.606	20.7	1.84	4.94	46.8	—	—	—	—	
~~09 57~~ MB											YSI Leaking, stop to adjust
10 00	22.29	0.620	34.3	2.98	4.93	125.1	21.17	300	19.1	600mL	
10 03	22.41	0.649	29.3	2.51	5.04	120.3	21.16	300	12.2	600mL	
10 06	22.54	0.727	29.3	2.53	4.92	165.8	21.16	300	6.63	600mL	
10 09	22.58	0.759	30.0	2.59	4.88	193.6	21.15	300	6.36	600mL	

Recorded By: Maria Briceno

Jones Road Superfund Site - Supplemental RI/FS
Harris County, Texas

Sheet 1 of 1
Date: 09/22/2016

Field Record of Well Purging and Sampling

Well ID: MW-04 **Sample ID:** MW-04 **Sample Time:** 11 35

Casing diameter/type: 2 inch PVC
Well location: Behind Cypress Centre
Weather: 90° Sunny
Screened interval(s): 25 - 35
Sampling personnel: Maria B. ; John B
Total depth: 35
Sampling method: Low - Flow
Initial depth to water (w/o pump): ~~20.71~~ MB 20.17
Water level indicator: ~~YSI~~ MB
Final depth to water (w/o pump): 20.96
Water quality meter: YSI
Measuring point: **North side of casing**
Pump depth setting: ~~18.75~~ ~~22.5~~ 22.5
Pump type/model: Monsoon

Time	Temp (°C)	Conductiv (mS/cm) or (µS/cm)	%DO	DO (mg/L)	pH	ORP (mV)	Water Level (feet btoc)	Flow Rate (L/min) or (mL/min)	Turbidity (NTU)	Purge Volume (L) or (mL)	Additional Comments
11 12											Pump on
11 15	21.91	1.483	23.7	1.94	5.10	112.7	22.07	250	60.8	500 mL	
11 24 ~~11 18~~	21.61	1.496	32.2	2.73	4.98	196.5	22.21	300	18.4	500mL	YSI leaking, stop to adjust
11 27	21.59	1.507	22.1	1.94	4.83	194.3	22.5	300	7.73	600mL	
11 30	21.56	1.499	22.1	1.94	4.76	230.5	22.5	300	6.17	600mL	

Recorded By: Maria Briceno

Jones Road Superfund Site - Supplemental RI/FS
Harris County, Texas

Date: ~~09/21/2016~~

Field Record of Well Purging and Sampling

Well ID: MW-05 Sample ID: MW-05 Sample Time: 12 50

Casing diameter/type: 2inch PVC
Well location: Behind the Cypress Centre
Weather: 100° Sunny
Screened interval(s): 2-35
Sampling personnel: Maria B; John B.
Total depth: 35
Sampling method: low flow
Initial depth to water (w/o pump): ~~20.00~~ MB 20.82
Water level indicator: dipper-T
Final depth to water (w/o pump): 21.01
Water quality meter: YSI
Measuring point: **North side of casing**
Pump depth setting: 27.9
Pump type/model: Monsoon

Time	Temp (°C)	Conductiv (mS/cm) or (µS/cm)	%DO	DO (mg/L)	pH	ORP (mV)	Water Level (feet btoc)	Flow Rate (L/min) or (mL/min)	Turbidity (NTU)	Purge Volume (L) or (mL)	Additional Comments
12 36											Pump on
12 38	25.51	1.052	52.7	4.32	4.93	549.8	21.22	300	248	900mL	
12 41	23.57	1.013	23.5	1.99	4.13	616.8	21.24	250	532	750mL	
12 44	23.22	1.008	21.8	1.85	4.16	636.5	21.20	250	530	750mL	
12 47	23.27	1.027	21.9	1.85	4.29	638.8	21.24	250	454	750mL	

Recorded By: Maria Briceno

Field Record of Well Purging and Sampling

Well ID: MW-06 Sample ID: MW-06 Sample Time: 07 45

Casing diameter/type: 2inch PVC Well location: Cypress Centre Weather: 80° Sunny

Screened interval(s): 2 - 35 Sampling personnel: Maria Briceno ; John Bonner

Total depth: 35 Sampling method: Grab

Initial depth to water (w/o pump): 33.43 Water level indicator:

Final depth to water (w/o pump): Water quality meter:

Measuring point: **North side of casing** Pump depth setting: Pump type/model:

Time	<10% Temp (°C)	<10% Conductiv (mS/cm) or (µS/cm)	%DO	DO (mg/L)	<0.1pH pH	ORP (mV)	<0.3ft Water Level (feet btoc)	<1L/min Flow Rate (L/min) or (mL/min)	Turbidity (NTU)	<0.5L/min Purge Volume (L) or (mL)	Additional Comments
											Water level was low .
											Used a bailor to collect sample

Recorded By: Maria Briceno

Jones Road Superfund Site - Supplemental RI/FS
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Date: 09/21/2016

Field Record of Well Purging and Sampling

Well ID: MW-07 | Sample ID: MW-07 | Sample Time: 0925

Casing diameter/type: 2inch PVC
Well location: Cypress Centre
Weather: 90° Sunny
Screened interval(s): 20-35
Sampling personnel: Maria B. ; ~~[illegible]~~ John B.
Total depth: 35
Sampling method: Low-Flow /Grab
Initial depth to water (w/o pump): 28.05
Water level indicator:
Final depth to water (w/o pump):
Water quality meter: YSI
Measuring point: **North side of casing**
Pump depth setting: 31.5
Pump type/model: Monsoon

Time	Temp (°C)	Conductiv (mS/cm) or (µS/cm)	%DO	DO (mg/L)	pH	ORP (mV)	Water Level (feet btoc)	Flow Rate (L/min) or (mL/min)	Turbidity (NTU)	Purge Volume (L) or (mL)	Additional Comments
											Pump would not go through the
											well! Decided to use a bailor

Recorded By: Maria Briceno

Date: 09/20/2016

Field Record of Well Purging and Sampling

Well ID: MW-08 Sample ID: MW-08 MS/MSD Sample Time: 1355

Casing diameter/type: 2inch PVC
Well location: Next to FIX-A-KAR
Weather: 100° Sunny
Screened interval(s): 20.5 - 35.5
Sampling personnel: Maria B. ; John B.
Total depth: ~~33.80~~ MB 36.5
Sampling method: Low-Flow
Initial depth to water (w/o pump): 18.82
Water level indicator: dipper-T
Final depth to water (w/o pump): 18.5
Water quality meter: YSI
Measuring point: **North side of casing**
Pump depth setting: 26.31
Pump type/model: Monsoon

Time	Temp (°C)	Conductiv (mS/cm) or (µS/cm)	%DO	DO (mg/L)	pH	ORP (mV)	Water Level (feet btoc)	Flow Rate (L/min) or (mL/min)	Turbidity (NTU)	Purge Volume (L) or (mL)	Additional Comments
1335											Pump On
1336	24.36	0.835	39.1	3.26	5.17	393.4	19.67	300 mL/m	301	500mL	
1339	24.26	0.834	28.1	2.32	4.60	436.5	19.69	350 mL/m	175	900 mL	
1342	24.04	0.830	22.8	1.93	4.07	549.9	19.61	300 mL/min	78.8	1.5 L	
1345	24.37	0.837	21.9	1.82	3.95	585.0	19.61	250 mL/min	50.8	2.0 L	
1348	24.28	0.840	21.0	1.75	3.74	605.5	19.60	250 mL/min	41.3	2.5 L	
1351	24.62	0.840	19.9	1.64	3.64	622.2	19.58	250 mL/min	32.0	3.0L	

Recorded By: Maria Briceno

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Field Record of Well Purging and Sampling

Well ID: MW-09 | Sample ID: MW-09 | Sample Time: 13 35

Casing diameter/type: 2inch PVC
Well location: ~~In~~ ~~front~~ MB Next to ACE Hardware
Weather: 89° Sunny
Screened interval(s): 20 - 35
Sampling personnel: Maria B. ; John B.
Total depth: 35
Sampling method: Low Flow
Initial depth to water (w/o pump): 23.93
Water level indicator: dipper T
Final depth to water (w/o pump): 24.5
Water quality meter: YSI
Measuring point: **North side of casing**
Pump depth setting: ~~27.5~~ MB 29.5
Pump type/model: Monsoon

Time	Temp (°C)	Conductiv (mS/cm) or (µS/cm)	%DO	DO (mg/L)	pH	ORP (mV)	Water Level (feet btoc)	Flow Rate (L/min) or (mL/min)	Turbidity (NTU)	Purge Volume (L) or (mL)	Additional Comments
13 20											Pump on
13 23	24.42	1.180	30.8	2.59	5.29	269.9	24.90	350	131	1.00L	
13 26	23.36	1.145	24.7	2.10	4.41	492.8	24.84	300	139	1.00L	
13 29	24.04	1.160	28.7	2.41	4.00	565.0	24.83	300	101	1.00L	
13 32	24.03	1.156	29.2	2.47	3.80	599.8	25.03	300	66.5	1.00L	

Recorded By: Maria Briceno

Jones Road Superfund Site - Supplemental RI/FS
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Field Record of Well Purging and Sampling

Well ID: MW-20 **Sample ID:** MW-20 **Sample Time:** 08 55

Casing diameter/type: 2inch PVC
Well location: Cypress Centre
Weather: 80° Sunny
Screened interval(s): 25 - 30
Sampling personnel: Maria B. ; John B
Total depth: 32
Sampling method: Low - Flow
Initial depth to water (w/o pump): 26.48
Water level indicator: dipper - T
Final depth to water (w/o pump): 26.64
Water quality meter: YSI
Measuring point: **North side of casing**
Pump depth setting: 27.5
Pump type/model: Monsoon

Time	Temp (°C)	Conductiv (mS/cm) or (µS/cm)	%DO	DO (mg/L)	pH	ORP (mV)	Water Level (feet btoc)	Flow Rate (L/min) or (mL/min)	Turbidity (NTU)	Purge Volume (L) or (mL)	Additional Comments
08 42											Pump on
08 43	26.47	2.588	54	4.32	5.87	-60	27.02	300	447	500 mL	
08 46	26.23	2.325	21.6	1.70	5.81	-51.9	27.13	300	482	500 mL	Water had a brownish color
08 49	26.58	2.232	18.2	1.45	5.74	-30.1	27.03	250	332	500 mL	
08 52	26.91	2.166	18.2	1.44	5.67	-8.0	27.24	300	~~[illegible]~~ 278	600 mL	

Recorded By: Maria Briceno

Jones Road Superfund Site - Supplemental RI/FS
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Field Record of Well Purging and Sampling

Well ID: MW-21 **Sample ID:** MW-21 **Sample Time:** 08 10

Casing diameter/type: 2inch PVC
Well location: Cypress Centre
Weather: 78° Sunny
Screened interval(s): 25-30
Sampling personnel: Maria B., John B.
Total depth: 32
Sampling method: Low Flow
Initial depth to water (w/o pump): 25.65
Water level indicator: dipper T
Final depth to water (w/o pump): 25.77
Water quality meter: YSI
Measuring point: **North side of casing**
Pump depth setting: 27.5
Pump type/model: Monsoon

Time	Temp (°C)	Conductiv (mS/cm) or (µS/cm)	%DO	DO (mg/L)	pH	ORP (mV)	Water Level (feet btoc)	Flow Rate (L/min) or (mL/min)	Turbidity (NTU)	Purge Volume (L) or (mL)	Additional Comments
07 51											Pump on
07 54	24.77	1.063	44.1	3.67	5.98	231.7	26.16	500mL/m	24.1	700mL	
07 57	24.61	1.036	19.2	1.57	5.93	333.5	26.05	250mL/m	35.2	500mL	
08 00	24.83	1.042	15.5	1.27	6.01	374.6	26.02	250mL/m	24.0	500mL	
08 03	25.02	1.050	14.7	1.21	6.11	408.6	26.04	250mL/m	15.5	500mL	
0807	25.05	1.052	14.2	1.18	6.16	426.2	26.03	250ml/m	11.7	500mL	

Recorded By: Maria Briceno

Sheet 1 of 1
Date: 09/21/2016

Field Record of Well Purging and Sampling

Well ID: MW-22 **Sample ID:** MW-22 **Sample Time:** 08:15

Casing diameter/type: 2" PVC
Well location: Cypress Centre
Weather: 80° Sunny
Screened interval(s): 48 - 53
Sampling personnel: Maria B.; John B.
Total depth: 55
Sampling method: Grab
Initial depth to water (w/o pump): 53.38
Water level indicator:
Final depth to water (w/o pump):
Water quality meter:
Measuring point: **North side of casing**
Pump depth setting:
Pump type/model:

Time	Temp (°C)	Conductiv (mS/cm) or (µS/cm)	%DO	DO (mg/L)	pH	ORP (mV)	Water Level (feet btoc)	Flow Rate (L/min) or (mL/min)	Turbidity (NTU)	Purge Volume (L) or (mL)	Additional Comments
											Used a bailor to collect
											sample

Recorded By: Maria Briceno

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Date: 09/21/2016

Field Record of Well Purging and Sampling

Well ID: ~~MW-023~~ MW-23 **Sample ID:** MW-23 ~~MW~~-Dup **Sample Time:** 1017

Casing diameter/type: 2 inch PVC
Well location: Cypress Centre
Weather: 95° Sunny
Screened interval(s): 48 - 53
Sampling personnel: John B. ; Maria B.
Total depth:
Sampling method: Low Flow
Initial depth to water (w/o pump): 44.43
Water level indicator: Clipper T
Final depth to water (w/o pump):
Water quality meter: YSI
Measuring point: **North side of casing**
Pump depth setting: 51
Pump type/model: Monsoon

Time	Temp (°C)	Conductiv (mS/cm) or (µS/cm)	%DO	DO (mg/L)	pH	ORP (mV)	Water Level (feet btoc)	Flow Rate (L/min) or (mL/min)	Turbidity (NTU)	Purge Volume (L) or (mL)	Additional Comments
09 58											Pump on
~~04~~ MB											
10 01	25.19	0.674	40.0	3.29	5.73	263.8	45.10	250	~~150~~ MB 15.2	250mL	
10 04	25.46	0.669	30.4	2.49	5.0	479.9	46.08	300mL	23.1	500mL	
10 07	25.28	0.672	26.1	2.15	4.75	546.9	46.39	300mL	264	900mL	
10 10	25.09	0.676	24.3	2.0	4.62	590.6	46.0	350mL	344	900mL	
10 13	25.29	0.680	23.5	1.92	4.67	616.8	46.43	300mL	182	900mL	

Recorded By: Maria Briceno

Jones Road Superfund Site - Supplemental RI/FS
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Date: 09/21/2016

Field Record of Well Purging and Sampling

Well ID: MW-24 **Sample ID:** MW-24 **Sample Time:** 1350

Casing diameter/type: 2inch PVC
Well location: O' Raily Autoparts parking lot
Weather: 100° Sonny
Screened interval(s): 48 - 53
Sampling personnel: Maria B. ; Jonh B.
Total depth: 55
Sampling method: Low - Flow
Initial depth to water (w/o pump): 19.47
Water level indicator: dipper - T
Final depth to water (w/o pump): 27.46
Water quality meter: YSI
Measuring point: **North side of casing**
Pump depth setting: 50.5
Pump type/model: Monsoon

Time	Temp (°C)	Conductiv (mS/cm) or (µS/cm)	%DO	DO (mg/L)	pH	ORP (mV)	Water Level (feet btoc)	Flow Rate (L/min) or (mL/min)	Turbidity (NTU)	Purge Volume (L) or (mL)	Additional Comments
1335											Pump on
1337	27.01	0.430	44.5	3.51	6.30	399.9	20.53	200 mL	10.2	600mL	
1340	26.6	0.580	37.5	2.93	5.30	566.3	22.08	200 mL	65.3	600mL	
1343	25.24	0.587	26.9	2.17	4.92	624.4	24.15	300mL	57.7	900mL	
1346	25.25	0.559	25.4	2.07	4.82	644.3	25.33	300mL	52.6	900mL	

Recorded By: Maria Briceno

Sheet 1 of 1
Date: 09/21/16

Field Record of Well Purging and Sampling

Well ID: MW-25 **Sample ID:** MW-25 **Sample Time:**

Casing diameter/type:
Well location: Century Appliances
Weather: 90's Sunny
Screened interval(s): 23-28
Sampling personnel: Maria B; John B.
Total depth: 30
Sampling method: ~~Grab~~ MB
Initial depth to water (w/o pump): 29.62
Water level indicator:
Final depth to water (w/o pump):
Water quality meter:
Measuring point: **North side of casing**
Pump depth setting:
Pump type/model:

Time	Temp (°C)	Conductiv (mS/cm) or (µS/cm)	%DO	DO (mg/L)	pH	ORP (mV)	Water Level (feet btoc)	Flow Rate (L/min) or (mL/min)	Turbidity (NTU)	Purge Volume (L) or (mL)	Additional Comments
											Sample was not collected.
											Dry Well

Recorded By: Maria Briceno

Jones Road Ground Water Plume Superfund Site, Houston, Harris County, Texas

Sheet _____ of _____
Date: 9/13/17

Ground Water Sampling Data Sheet

Well ID: Mw-1 | Sample ID: Mw-1 | Sample Time: 1110

Casing diameter/type: 2"
Screened interval(s): 2.5-35
Total depth: 35'
Initial depth to water (w/o pump): 22.93
Final depth to water (w/o pump): 25.78
Measuring point: **North side of casing**

Well location: Front of Grocery
Sampling personnel: WG, AO
Sampling method: **Low-flow micropurge**
Water level indicator: Geotech
Water quality meter: YSI
Pump depth setting: ~28'

Weather: Overcast 80°
Pump type/model: SS Monsoon

5 min	Δ < 10%	Δ < 10%			Δ < 0.1 pH		Δ < 0.3 ft	< 1L/min		< 0.5 L/min	Parameter Stabilization Limits (3 consecutive readings)
Time	**Temp (°C)**	**Conductivity (mS/cm) or (μS/cm)**	**DO (%)**	**DO (mg/L)**	**pH**	**ORP (mV)**	**Water Level (feet btoc)**	**Flow Rate (L/min) or (mL/min)**	**Turbidity (NTU)**	**Purge Volume (L) or (mL)**	**Additional Comments**
1045	27.0	2852	9.8	0.75	6.68	-96.8	23.43	200	41.64		
1048	27.5	2793	3.8	0.30	6.46	-116.1	23.58	200	35.64		
1051	27.8	2784	3.7	0.28	6.44	-118.3	23.73	200	22.28		
1054	27.8	2783	3.5	0.27	6.47	-120.8	23.87	200	19.06		
1057	27.9	2772	3.2	0.25	6.50	-124.4	23.89	200	19.56		
1100	28.1	2756	2.9	0.23	6.51	-127.4	23.91	200	20.55		
										3/4 gal	

Recorded By: W. Ganter

Jones Road Ground Water Plume Superfund Site, Houston, Harris County, Texas

Sheet _____ of _____
Date: 9/13/17

Ground Water Sampling Data Sheet

Well ID: MW-02 | Sample ID: MW-02 | Sample Time: 1010

Casing diameter/type:
Well location: Behind Market
Weather: Cool, Overcast 79°
Screened interval(s): 2.5-35'
Sampling personnel: WG, AD
Total depth: 35
Sampling method: Low-flow micropurge
Initial depth to water (w/o pump): 20.60
Water level indicator: Geotech
Final depth to water (w/o pump): 22.10
Water quality meter: YSI
Measuring point: North side of casing
Pump depth setting: ~27.0'
Pump type/model: SS Monsoon

5 min	Δ < 10%	Δ < 10%			Δ < 0.1 pH		Δ < 0.3 ft	< 1L/min		< 0.5 L/min	Parameter Stabilization Limits (3 consecutive readings)
Time	Temp (°C)	Conductivity (mS/cm) or (µS/cm)	DO (%)	DO (mg/L)	pH	ORP (mV)	Water Level (feet btoc)	Flow Rate (L/min) or (mL/min)	Turbidity (NTU)	Purge Volume (L) or (mL)	Additional Comments
0945	24.8	1207	16.4	1.03	7.15	-28.6	21.61	200	30.02		
0948	25.1	1206	4.6	0.37	6.84	-68.0	21.49	200	22.79		
0951	25.4	1206	3.8	0.31	6.88	-83.8	21.42	200	21.78		
0954	25.6	1211	3.8	0.31	6.88	-90.2	21.42	200	19.83		
0957	25.8	1214	3.6	0.29	6.88	-96.4	21.41	200	19.33		
1000	26.0	1218	3.3	0.27	6.89	-99.9	21.41	200	14.78		
										~~0.5gal~~	
										3.5gal	

Recorded By: W. Canter

Jones Road Ground Water Plume Superfund Site, Houston, Harris County, Texas

Sheet ___ of ___
Date: 9/12/17

Ground Water Sampling Data Sheet

Well ID: Mw-3 Sample ID: Mw-3 Sample Time: 1315

Casing diameter/type: 2"
Well location: Behind Mahony
Weather: Clear 86°
Screened interval(s): 2.5'-35'
Sampling personnel: WG, AB
Total depth: 35'
Sampling method: **Low-flow micropurge**
Initial depth to water (w/o pump): wy ~~27.30~~ 19.23
Water level indicator: Geotech
Final depth to water (w/o pump): 19.41
Water quality meter: YSI
Measuring point: **North side of casing**
Pump depth setting: wy ~~186'~~ ~27.5
Pump type/model: SS Monsoon

5 min	Δ < 10%	Δ < 10%			Δ < 0.1 pH		Δ < 0.3 ft	< 1L/min		< 0.5 L/min	Parameter Stabilization Limits (3 consecutive readings)
Time	**Temp (°C)**	**Conductivity (mS/cm) or (µS/cm)**	**DO (%)**	**DO (mg/L)**	**pH**	**ORP (mV)**	**Water Level (feet btoc)**	**Flow Rate (L/min) or (mL/min)**	**Turbidity (NTU)**	**Purge Volume (L) or (mL)**	**Additional Comments**
1255	24.9	1119	12.4	0.95	7.34	82.7	19.90	250	57.21		
1258	24.1	1111	4.1	0.34	6.44	98.9	19.93	250	48.56		
1301	24.6	1106	3.5	0.30	6.48	90.7	19.50	200	40.82		
1304	25.2	1108	3.8	0.31	6.83	79.8	19.52	200	39.00		
1307	29.4	1106	3.8	0.31	6.67	71.6	19.49	200	40.76		
1310	25.2	1103	3.5	0.29	6.67	69.0	19.50	200	32.12		
										3/4 gal	

Recorded By: W. Ganter

Jones Road Ground Water Plume Superfund Site, Houston, Harris County, Texas

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Date: 9/12/17

Ground Water Sampling Data Sheet

Well ID: MW-4 | Sample ID: MW-4 | Sample Time: 1430

Casing diameter/type: 2"
Well location: Behind Melong
Weather: Clear 87°
Screened interval(s): 2'-35'
Sampling personnel: WG, AB
Total depth: 35
Sampling method: **Low-flow micropurge**
Initial depth to water (w/o pump): 19.05
Water level indicator: Geotech
Final depth to water (w/o pump): 21.33
Water quality meter: YSI
Measuring point: **North side of casing**
Pump depth setting: 28'
Pump type/model: SS Monsoon

5 min	Δ < 10%	Δ < 10%			Δ < 0.1 pH		Δ < 0.3 ft	< 1L/min		< 0.5 L/min	Parameter Stabilization Limits (3 consecutive readings)
Time	**Temp (°C)**	**Conductivity (mS/cm) or (µS/cm)**	**DO (%)**	**DO (mg/L)**	**pH**	**ORP (mV)**	**Water Level (feet btoc)**	**Flow Rate (L/min) or (mL/min)**	**Turbidity (NTU)**	**Purge Volume (L) or (mL)**	**Additional Comments**
1410	23.5	1585	75.2	6.08	6.96	-25.4	20.15	250	37.49		
1413	23.5	1578	5.2	0.43	6.28	-29.6	20.33	250	40.26		Water has strong
1416	23.8	1581	3.2	0.27	6.31	-45.3	20.50	250	29.34		odor. Bio?
1419	23.9	1587	2.1	0.18	6.41	-63.5	20.52	250	23.4		
1422	23.9	1588	1.9	0.15	6.45	-72.2	20.67	250	21.77		
1425	23.9	1586	1.7	0.14	6.46	-79.6	20.70	250	19.43		
										3/4 gal	

Recorded By: W. Ganter

Jones Road Ground Water Plume Superfund Site, Houston, Harris County, Texas

Sheet _____ of _____
Date: 9/13/17

Ground Water Sampling Data Sheet

Well ID: Mw-5 | Sample ID: Mw-5 | Sample Time: 1615

Casing diameter/type: 2"
Screened interval(s): 2-35
Total depth: 35
Initial depth to water (w/o pump): 20.04
Final depth to water (w/o pump): 20.95
Measuring point: **North side of casing**

Well location: Behind Mehong
Sampling personnel: WG, AO
Sampling method: **Low-flow micropurge**
Water level indicator: Geotech
Water quality meter: YSI
Pump depth setting: ~28.0

Weather: Overcast 80°
Pump type/model: SS Monsoon

Time	Temp (°C)	Conductivity (mS/cm) or (µS/cm)	DO (%)	DO (mg/L)	pH	ORP (mV)	Water Level (feet btoc)	Flow Rate (L/min) or (mL/min)	Turbidity (NTU)	Purge Volume (L) or (mL)	Additional Comments
5 min	Δ < 10%	Δ < 10%			Δ < 0.1 pH		Δ < 0.3 ft	< 1L/min		< 0.5 L/min	Parameter Stabilization Limits (3 consecutive readings)
1550	24.4	1997	13.4	1.68	6.84	79.8	20.56	200	~~4~~ 64.53		
1553	23.7	1937	9.6	0.81	6.29	93.0	20.80	200	58.34		
1556	24.1	1915	10.9	0.91	6.31	89.7	20.82	200	810 ou		
1559	24.1	1911	11.1	0.93	6.34	88.2	20.82	200	136 ou		
1602	24.1	1916	11.4	0.96	6.41	85.6	20.85	200	92.95		
1605	24.1	1936	10.5	0.88	6.44	83.7	20.85	200	79.12		
										3/4 gal	

Recorded By: W. Ganter

Jones Road Ground Water Plume Superfund Site, Houston, Harris County, Texas

Sheet _____ of _____
Date: 9/11/17

Ground Water Sampling Data Sheet

Well ID: Mw-06 Sample ID: Mw-06 Sample Time: 1645

Casing diameter/type: 2"
Screened interval(s): 2-35
Total depth: 35
Initial depth to water (w/o pump): 31.2
Final depth to water (w/o pump): 33.7
Measuring point: **North side of casing**

Well location:
Sampling personnel: WG, AB
Sampling method: **Low-flow micropurge**
Water level indicator: Geotech
Water quality meter: YSI
Pump depth setting:

Weather: Warm clear 85°
Pump type/model: /

5 min	Δ < 10%	Δ < 10%			Δ < 0.1 pH		Δ < 0.3 ft	< 1L/min		< 0.5 L/min	Parameter Stabilization Limits (3 consecutive readings)
Time	**Temp (°C)**	**Conductivity (mS/cm) or (µS/cm)**	**DO (%)**	**DO (mg/L)**	**pH**	**ORP (mV)**	**Water Level (feet btoc)**	**Flow Rate (L/min) or (mL/min)**	**Turbidity (NTU)**	**Purge Volume (L) or (mL)**	**Additional Comments**
		Hand									
		Bail									

Recorded By: W. Gantor

Jones Road Ground Water Plume Superfund Site, Houston, Harris County, Texas

Sheet _____ of _____
Date: 9/11/17

Ground Water Sampling Data Sheet

Well ID: Mw-7 **Sample ID:** Mw-7 **Sample Time:** 1315

Casing diameter/type: 2"
Well location:
Weather: Warm Clear 85°
Screened interval(s): 20-35
Sampling personnel: WG, AD
Total depth: 35'
Sampling method: **Low-flow micropurge**
Initial depth to water (w/o pump): 26.73
Water level indicator: Geotech
Final depth to water (w/o pump): 27.13
Water quality meter: YSI
Measuring point: **North side of casing**
Pump depth setting: 32'
Pump type/model: ~~SS Monsoon~~ wp

5 min	Δ < 10%	Δ < 10%			Δ < 0.1 pH		Δ < 0.3 ft	< 1L/min		< 0.5 L/min	Parameter Stabilization Limits (3 consecutive readings)
Time	**Temp (°C)**	**Conductivity (mS/cm) or (µS/cm)**	**DO (%)**	**DO (mg/L)**	**pH**	**ORP (mV)**	**Water Level (feet btoc)**	**Flow Rate (L/min) or (mL/min)**	**Turbidity (NTU)**	**Purge Volume (L) or (mL)**	**Additional Comments**
		Hand									
		Bail									
											Collected FB/ER

Recorded By: WG

Jones Road Ground Water Plume Superfund Site, Houston, Harris County, Texas

Sheet _____ of _____
Date: 9/13/17

Ground Water Sampling Data Sheet

Well ID: MW-8 | Sample ID: MW-8 | Sample Time: 0815

Casing diameter/type: 2"
Well location: Lumber Yard
Weather: Cool, Overcast 73°
Screened interval(s): 20-35.5
Sampling personnel: WG, AP
Total depth: 36.5
Sampling method: **Low-flow micropurge**
Initial depth to water (w/o pump): 17.61
Water level indicator: Geotech
Final depth to water (w/o pump): 17.81
Water quality meter: YSI
Measuring point: **North side of casing**
Pump depth setting: 26
Pump type/model: SS monsoon

5 min	Δ < 10%	Δ < 10%			Δ < 0.1 pH		Δ < 0.3 ft	< 1L/min		< 0.5 L/min	Parameter Stabilization Limits (3 consecutive readings)
Time	**Temp (°C)**	**Conductivity (mS/cm) or (µS/cm)**	**DO (%)**	**DO (mg/L)**	**pH**	**ORP (mV)**	**Water Level (feet btoc)**	**Flow Rate (L/min) or (mL/min)**	**Turbidity (NTU)**	**Purge Volume (L) or (mL)**	**Additional Comments**
755	23.5	1458	15.9	1.24	6.69	106.0	17.95	200	71.44		
758	24.0	1458	4.2	0.35	6.83	91.3	17.87	200	60.29		
801	24.1	1458	4.1	0.34	6.84	87.8	17.83	200	48.93		
804	24.3	1459	3.7	0.31	6.84	86.5	17.83	200	42.86		
807	24.3	1459	4.5	0.37	6.82	87.1	17.82	200	40.44		
										~~0.5 gal~~ 3 gal	

Recorded By: W. Ganter

Jones Road Ground Water Plume Superfund Site, Houston, Harris County, Texas

Sheet _____ of _____
Date: 9/13/17

Ground Water Sampling Data Sheet

Well ID: MW-20   Sample ID: MW-20   Sample Time: 1345

Casing diameter/type: 2"
Well location: Parkin Lot, Cypress Centre
Weather: Overcast 88°
Screened interval(s): 20-32.5
Sampling personnel: WG, AB
Total depth: ~~32'~~ 35.0
Sampling method: Low-flow micropurge
Initial depth to water (w/o pump): 25.58
Water level indicator: Geotech
Final depth to water (w/o pump):
Water quality meter: YSI
Measuring point: North side of casing
Pump depth setting: 29'
Pump type/model: SS Monsoo

5 min	Δ < 10%	Δ < 10%			Δ < 0.1 pH		Δ < 0.3 ft	< 1L/min		< 0.5 L/min	Parameter Stabilization Limits (3 consecutive readings)
Time	Temp (°C)	Conductivity (mS/cm) or (µS/cm)	DO (%)	DO (mg/L)	pH	ORP (mV)	Water Level (feet btoc)	Flow Rate (L/min) or (mL/min)	Turbidity (NTU)	Purge Volume (L) or (mL)	Additional Comments
1325	28.2	2938	12.0	0.91	6.53	-60.8	26.23	200	1300ov		Water level is
1328	29.0	2966	3.1	0.24	6.17	-55.0	26.04	200	1509ov		very low. Pump wont
1331	29.3	2970	2.7	0.21	6.21	-60.6	26.05	200	733ov		go past 30'
1334	29.3	2975	2.7	0.21	6.26	-64.7	26.05	200	626ov		
1337	29.3	2984	2.6	0.19	6.32	-69.4	26.09	200	~~86.10~~	27.2	
1340	29.2	2989	2.2	0.17	6.34	-70.2	26.13	200	68.24		
										3/4 gal	

Recorded By: W. Ganter

Jones Road Ground Water Plume Superfund Site, Houston, Harris County, Texas

Sheet _____ of _____

Date: 9/12/17

Ground Water Sampling Data Sheet

Well ID: Mw-9 | Sample ID: Mw-9 | Sample Time: 1800

Casing diameter/type: 2" | Well location: Firework Shack | Weather: Clear 80°

Screened interval(s): 20-35 | Sampling personnel: WG, AB

Total depth: 35' | Sampling method: **Low-flow micropurge**

Initial depth to water (w/o pump): 22.1 | Water level indicator: Geotech

Final depth to water (w/o pump): 24.95 | Water quality meter: YSI

Measuring point: **North side of casing** | Pump depth setting: 27 | Pump type/model: SS Monsoon

5 min	Δ < 10%	Δ < 10%			Δ < 0.1 pH		Δ < 0.3 ft	< 1L/min		< 0.5 L/min	Parameter Stabilization Limits (3 consecutive readings)
Time	**Temp (°C)**	**Conductivity (mS/cm) or (µS/cm)**	**DO (%)**	**DO (mg/L)**	**pH**	**ORP (mV)**	**Water Level (feet btoc)**	**Flow Rate (L/min) or (mL/min)**	**Turbidity (NTU)**	**Purge Volume (L) or (mL)**	**Additional Comments**
1738	24.6	1734	14.9	1.20	6.59	17.9	21.83	200	80.63		
1741	24.9	1722	12.5	1.01	6.38	22.7	23.34	200	156.0		
1744	26.1	1714	10.0	0.80	6.39	14.5	23.30	200	145.0		
1747	26.4	1721	8.8	0.70	6.43	-1.9	23.29	200	86.0		
1750	27.0	1705	7.7	0.61	6.63	-11.0	23.32	200	71.8		
1753	27.2	1688	7.2	0.57	6.65	-15.0	23.31	200	46.0		
1756	27.5	1674	6.8	0.53	6.66	-18.2	23.30	200	92.41		
1759										[illegible] 3gal	

Recorded By: W. Ganter

Jones Road Ground Water Plume Superfund Site, Houston, Harris County, Texas

Sheet ____ of ____
Date: 9/13/17

Ground Water Sampling Data Sheet

Well ID: Mw-21 | Sample ID: Mw-21 | Sample Time: 1515

Casing diameter/type: 2"
Well location: Pet Grooming Pking Lot
Weather: Overcast Breezy 89°
Screened interval(s):
Sampling personnel: WG, AB
Total depth: 29.73
Sampling method: Low-flow micropurge
Initial depth to water (w/o pump): 24.78
Water level indicator: Geotech
Final depth to water (w/o pump): 25.01
Water quality meter: YSI
Measuring point: North side of casing
Pump depth setting: 27'
Pump type/model: SS Monsoon

5 min	Δ < 10%	Δ < 10%			Δ < 0.1 pH		Δ < 0.3 ft	< 1L/min		< 0.5 L/min	Parameter Stabilization Limits (3 consecutive readings)
Time	Temp (°C)	Conductivity (mS/cm) or (μS/cm)	DO (%)	DO (mg/L)	pH	ORP (mV)	Water Level (feet btoc)	Flow Rate (L/min) or (mL/min)	Turbidity (NTU)	Purge Volume (L) or (mL)	Additional Comments
1453	27.3	1992	32.7	2.44	6.39	26.5	25.07	200	49.75		
1456	28.1	1973	4.4	0.34	6.23	29.6	25.03	200	39.90		
1459	28.4	1877	3.7	0.28	6.27	30.9	25.03	200	33.10		
1502	28.5	1853	3.3	0.25	6.30	30.9	25.03	200	25.44		
1505	28.6	1836	2.7	0.21	6.37	30.6	25.05	200	19.24		
1508	28.6	1837	2.5	0.19	6.39	30.1	25.06	200	12.28	3gal	

Recorded By: W. Ganter

Jones Road Ground Water Plume Superfund Site, Houston, Harris County, Texas

Sheet _____ of _____
Date: 8/12/17

Ground Water Sampling Data Sheet

Well ID: Mw-22 Sample ID: Mw-22 Sample Time: 1120

Casing diameter/type: 2"
Well location: Cypress Centre
Weather: Clear 82°
Screened interval(s): 48-53
Sampling personnel: WG, AB
Total depth: 55
Sampling method: **Low-flow micropurge**
Initial depth to water (w/o pump): 44.23
Water level indicator: Geotech
Final depth to water (w/o pump): 45.87
Water quality meter: YSI
Measuring point: **North side of casing**
Pump depth setting: 51'
Pump type/model: SS Monsoon

5 min	Δ < 10%	Δ < 10%			Δ < 0.1 pH		Δ < 0.3 ft	< 1L/min		< 0.5 L/min	Parameter Stabilization Limits (3 consecutive readings)
Time	**Temp (°C)**	**Conductivity (mS/cm) or (µS/cm)**	**DO (%)**	**DO (mg/L)**	**pH**	**ORP (mV)**	**Water Level (feet btoc)**	**Flow Rate (L/min) or (mL/min)**	**Turbidity (NTU)**	**Purge Volume (L) or (mL)**	**Additional Comments**
1100	25.9	2927	34.1	2.34	6.49	26.5	45.27	200	18.00		
1103	25.8	2941	8.1	0.64	6.24	9.7	45.05	200	91.0		
1106	25.8	2848	4.9	0.39	6.21	-0.5	44.96	200	~~613.00~~ WG → 136		
1109	26.1	2807	4.1	0.33	6.25	-6.8	44.98	220	97		
1112	26.3	2792	3.9	0.31	6.34	-15.7	44.96	200	38.0		
1115	26.6	2787	3.5	0.28	6.38	-20.8	44.96	200	76.71		
										~ 3gal	

Recorded By: W. Canter

2/13/2017

Jones Road Ground Water Plume Superfund Site, Houston, Harris County, Texas

Sheet _____ of _____
Date: 9/12/17

Ground Water Sampling Data Sheet

Well ID: Mw-23 Sample ID: Mw-23 Sample Time: 0950

Casing diameter/type: 2"
Well location:
Weather: Clear 80°
Screened interval(s): 48-53
Sampling personnel: WG AB
Total depth: 55
Sampling method: **Low-flow micropurge**
Initial depth to water (w/o pump): 43.67
Water level indicator: Geotech
Final depth to water (w/o pump): 45.21
Water quality meter: YSI
Measuring point: **North side of casing**
Pump depth setting: 51'
Pump type/model: Monsoon

5 min	Δ < 10%	Δ < 10%			Δ < 0.1 pH		Δ < 0.3 ft	< 1L/min		< 0.5 L/min	Parameter Stabilization Limits (3 consecutive readings)
Time	**Temp (°C)**	**Conductivity (mS/cm) or (µS/cm)**	**DO (%)**	**DO (mg/L)**	**pH**	**ORP (mV)**	**Water Level (feet btoc)**	**Flow Rate (L/min) or (mL/min)**	**Turbidity (NTU)**	**Purge Volume (L) or (mL)**	**Additional Comments**
0935	27.2	1167	22.4	1.75	7.12	57.8	46.25	300	60.08		
0938	25.1	1168	12.5	1.02	7.08	49.0	46.27	250	54.35		
0941	25.4	1173	10.9	0.88	7.05	43.2	46.41	250	85.53		
0944	25.6	1109	8.3	0.67	7.05	34.6	45.91	250	147.0		
0947	26.0	1194	8.7	0.70	7.04	28.5	45.51	250	678.0		
										3gal	

Recorded By: W. Garter

Jones Road Ground Water Plume Superfund Site, Houston, Harris County, Texas

Sheet ____ of ____
Date: 9/12/17

Ground Water Sampling Data Sheet

Well ID: Mw-24 | Sample ID: Mw-24 | Sample Time: 0855

Casing diameter/type: 2"
Well location: ORillys
Weather: Clear 79°
Screened interval(s): 48-53
Sampling personnel: WG, AB
Total depth: 55
Sampling method: **Low-flow micropurge**
Initial depth to water (w/o pump): 17.44
Water level indicator: Geotech
Final depth to water (w/o pump): 31.98
Water quality meter: YSI
Measuring point: **North side of casing**
Pump depth setting: 51'
Pump type/model: SS Monsoon

5 min	Δ < 10%	Δ < 10%			Δ < 0.1 pH		Δ < 0.3 ft	< 1L/min		< 0.5 L/min	Parameter Stabilization Limits (3 consecutive readings)
Time	**Temp (°C)**	**Conductivity (mS/cm) or (µS/cm)**	**DO (%)**	**DO (mg/L)**	**pH**	**ORP (mV)**	**Water Level (feet btoc)**	**Flow Rate (L/min) or (mL/min)**	**Turbidity (NTU)**	**Purge Volume (L) or (mL)**	**Additional Comments**
825	25.2	1051	9.1	0.65	7.39	13.7	21.76	200	41.61		
828	25.5	1030	6.2	0.50	7.32	4.9	23.45	200	36.29		
831	25.8	1034	6.2	0.50	7.30	0.1	24.09	250	39.87		
834	25.8	1026	5.6	0.45	7.30	-1.8	24.44	250	34.53		
837	26.1	1017	5.7	0.46	7.30	-2.6	25.77	200	31.85		
840	26.1	1009	5.2	0.50	7.30	-1.1	26.60	250	30.21		
843	26.1	989	6.8	0.55	7.31	2.3	27.3	250	30.43		
846	26.1	1001	6.8	0.57	7.30	2.1	27.47	250	30.32		
849	26.1	1003	5.4	0.48	7.30	-1.8	28.60	250	29.8		
852	25.8	933	9.6	0.59	7.32	10.0	29.7	250	27.2		
										4gal	

Recorded By: W Gunter

Jones Road Ground Water Plume Superfund Site, Houston, Harris County, Texas

Sheet ____ of ____
Date: 9/11/17

Ground Water Sampling Data Sheet

Well ID: Mw-25 | Sample ID: / | Sample Time: /

Casing diameter/type: 2"
Well location:
Weather: Clear 85°
Screened interval(s): 23-28
Sampling personnel: WG AB
Total depth: 30
Sampling method: **Low-flow micropurge**
Initial depth to water (w/o pump): 29.53
Water level indicator:
Final depth to water (w/o pump): 29.53
Water quality meter: YSI
Measuring point: **North side of casing**
Pump depth setting:
Pump type/model:

5 min	Δ < 10%	Δ < 10%			Δ < 0.1 pH		Δ < 0.3 ft	< 1L/min		< 0.5 L/min	Parameter Stabilization Limits (3 consecutive readings)
Time	**Temp (°C)**	**Conductivity (mS/cm) or (µS/cm)**	**DO (%)**	**DO (mg/L)**	**pH**	**ORP (mV)**	**Water Level (feet btoc)**	**Flow Rate (L/min) or (mL/min)**	**Turbidity (NTU)**	**Purge Volume (L) or (mL)**	**Additional Comments**
											No Water
											No Sample

Recorded By: WG

ATTACHMENT D

VISTA GEOSCIENCE INJECTION REPORT

Vista GeoScience

Expert Environmental Support Services for Site Investigation & Remediation

April 17, 2018

Patrick Appel
EA Engineering
400 State Highway 121 Bypass, Building C, Suite 100, Lewisville, TX 75067-8192
Via E-Mail: pappel@eaest.com

RE: Vista Project #18035.01; Application of Peroxychem EHC-L at 11529 Jones Road, Houston, TX

Dear John:

Attached is our summary of the injection event that was completed at the site referenced above. Feel free to contact us if you have any questions. We look forward to working with you again soon.

Sincerely,

Peter Wethington
Environmental Geologist
Vista Geoscience

Reviewed by:

Jeffrey Zajdel
Field Operations Manager
Vista Geoscience

Vista GeoScience Project No: 18035.01

Application of Peroxychem ECH-L for the
In-Situ Remediation of Chlorinated Solvents at:
11529 Jones Road, Houston, TX

Prepared for:
EA Engineering, Science, and Technology

April 17, 2018

Table of Contents

1 SITE HISTORY AND OVERVIEW

A location within the strip mall at 11529 Jones Road was previously a dry cleaner that had historically released chlorinated solvents into the ground. With a successful round of injections in 2016, Vista Geoscience was asked to return for a small second round of injections. A total of ten proposed locations were to be injected at; six in the western area of the shopping center and four in a grassy patch southwest of the shopping center. Both areas had different mix designs prepared by Peroxychem and EA Engineering. Mixing instructions can be found in section 4 of this document.

2 PRE-INJECTION ACTIVITIES

On March 21, 2018 Vista Geoscience (Vista) mobilized a Clean Inject injection trailer and a Geoprobe brand 7822DT direct push/auger combination track rig complete with Geoprobe brand injection tooling to 11529 Jones Road, Houston, TX. Upon arrival, Vista began setting up the site. This included site arrangement, receiving product shipments, equipment rentals, and coning off the work area. A security fence was also installed as the primary form of traffic control and safety for the duration of work activities. The installed fencing surrounded both injection areas, all equipment, and chemicals onsite. On Monday March 26, 2018, the site was set up and injections were ready to commence, however, there were delivery issues with the hydrant meter which moved the start of injections to the following day.

3 INJECTION EVENT

On March 27, 2018, Injections commenced. Injection tooling included one-and-a-half-inch probe rod with a four-foot retractable injection tool with a v-wrapped screen for injections. A total of six injection locations were completed in the western area of the parking lot on the first day with no surfacing. Each location was pushed to 32 feet below ground surface (bgs) and then pulled up to 28 feet to expose the injection screen. A custom injection manifold was built for this project to accommodate injecting at up to four injection locations at a time. Three injection locations were injected into at a time in the first area west of the shopping center. Each location varied in its flowrates and injection pressures. Vista attempted to keep injection pressures below 60-70 psi to allow the product to flow into the formation without displacing the water table. On March 28, 2017, four injection locations were completed in the south west area of the shopping center. All four injection locations were injected into at the same time with varying flow rates at each location. Injection pressures in this area were overall a bit higher and thus flow rates were affected. All injection pressures and flow rates can be found in section 6 of this document. Upon completion of injections, Vista cleaned up the site and packed all equipment. On March 29, 2018 the fencing company that created the exclusion zone informed Vista they would not be able to take down the fence until the following day. Vista broke down most of the fencing in the parking lot area into a neat pile to create more space in the lot before mobilizing off site.

In total, 15 drums of ELS were used along with 15 bags of EHC-L dry mix weighing 25 pounds each. Additionally, 550 pounds of supplemental sodium bicarbonate was used to create the injectate along with just over 3,600 gallons of mix water.

4 INJECTATE MIXING INSTRUCTIONS

Point	Top ft bgs	Bottom ft bgs	Water	ELS (Drums)	EHC-L (lbs)	KHCO3 (lbs)	Total Volume Injection (gal)
P-01	28	32	679	1.5	37.5	62.5	754
P-02	28	32	679	1.5	37.5	62.5	754
P-03	28	32	679	1.5	37.5	62.5	754
P-04	28	32	679	1.5	37.5	62.5	754
P-05	28	32	302	1.5	37.5	50	377
P-06	28	32	302	1.5	37.5	50	377
P-07	28	32	302	1.5	37.5	50	377
P-08	28	32	302	1.5	37.5	50	377
P-09	28	32	302	1.5	37.5	50	377
P-10	28	32	302	1.5	37.5	50	377

5 INJECTION MAP LOCATION

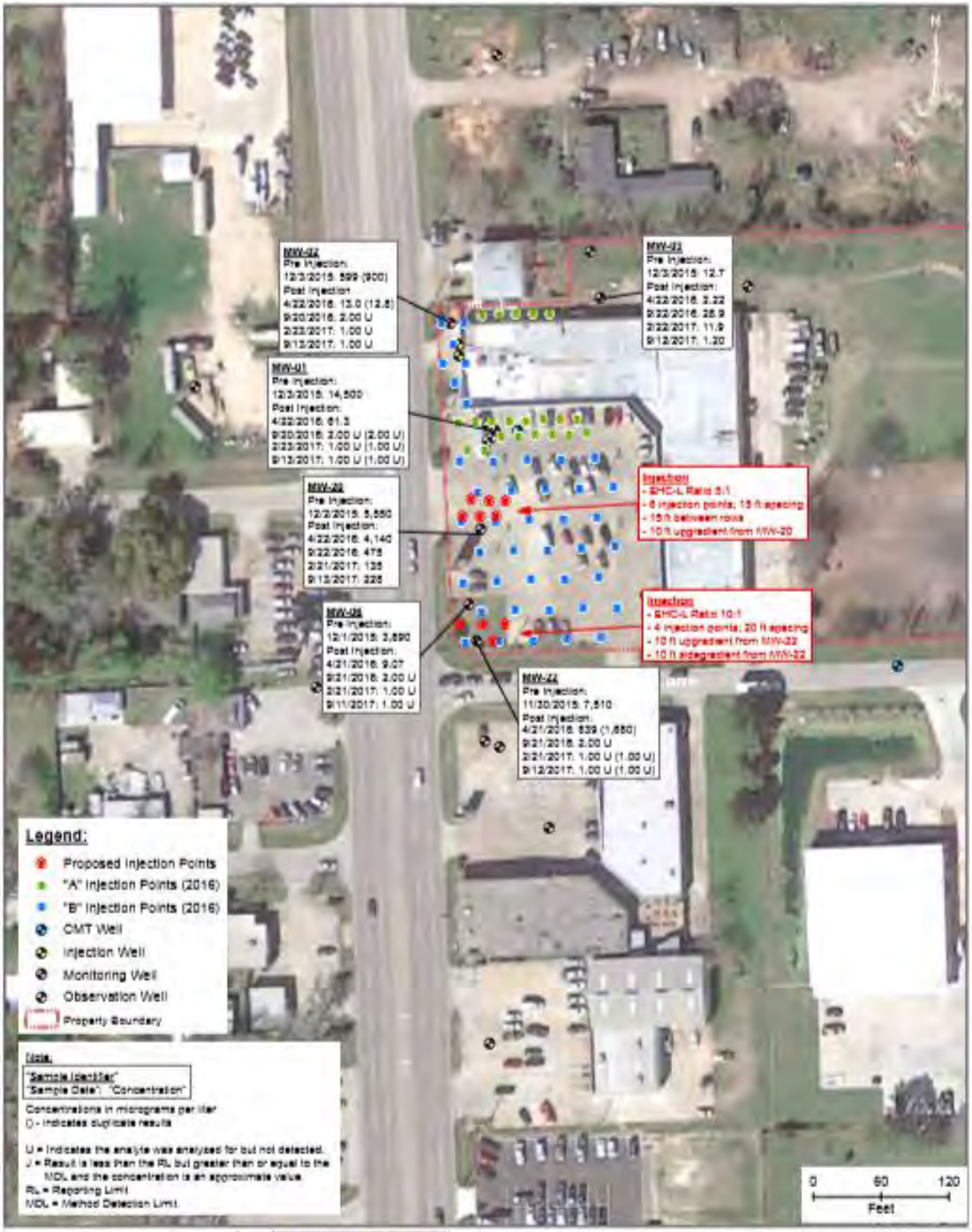

Image Source: GoogleEarth Pro, 2016

Figure X
Proposed Product Injection Locations
(PCE Results)

Remedial Action
Jones Road Ground Water Plume
Houston, Harris County, Texas

6 INJECTION LOGS

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Injection Log

Project No.: 18035.01	Injected Products: ELS	Inj. Tool:	Date: 3/27/2018	
Client: EA Engineering	EHC-L	Inj. Rig: VGS-45 Flatbed 3-Axle 18,000 GVW (Trailer - 5th		
Site Address: 11529 Jones Rd, Houston, TX	Sodium Biarbonate	Drill Rig: VGS-38 7822DT Geoprobe	Crew	JZ AG PW TS
		Drill Rig:		

Injection location ID	Start Time	End Time:	Interval (Ft. BGS)	ELS (Drums)	EHC-L (lbs)	Sodium Bicarbonate (lbs)				Mixed H2O (gal)	Cumulative Injected (gal)	Avg PSI	Avg. Flow Rate (gpm)	Notes/Comments:	Flow & pressure Graphs
IP-07	10:08		28-32	1.5	37.5	50				302					
	10:30										66	45	8		
	11:00										282	50	8.5		
	11:10										377	50	8.5		
				1.5	37.5	50	0	0	0	302					
IP-06	10:08		28-32	1.5	37.5	50				302					
	10:30										18	45	1		
	11:00										100	50	3.9		
	11:15										192	60	6.35		
	11:30										276	45	5		
	11:39										334	45	5.35		
	11:47										378	48	5.18		
				1.5	37.5	50	0	0	0	302					
IP-05	10:08		28-32	1.5	37.5	50				302					
	10:30										50	45	6		
	11:00										93	50	1		
	11:15										108.5	60	0.78		
	11:30										117	45	0.55		
	11:40										121.35	47	0.26		
	11:50										125.5	60	0.56		
	12:11										144.9	70	0.4		
	12:25										150.5	65	1.15		
	12:40										162	75	0.66		
	14:00										231.1	65	0.1		
	15:10										274.8	160	1.51		
	15:23										303.42	160	1.78		
	15:33										319.92	155	1.59		
	15:48										330.12	100	0.48		
											379			AIR DIAPHRAGM PUMP THE REMAINING VOL FROM MIXING TANK	
				1.5	37.5	50	0	0	0	302					
IP-08	11:30		28-32	1.5	37.5	50					0	45	3.9		
	11:38										52.25	46	5.98		
	11:50										134.5	60	9.15		
	12:00										220	65	8.65		
	12:10										297.5	75	3.1	REDUCED PUMP HZ TO PREVENT OVER-PRESSURE (RATE DECREASE)	
	12:26										319.5	70	1.5		
	12:40										327	75	0.45		
	12:50										334.6	90	1.1		
	13:00										344.75	100	0.92		
	13:10										355	100	0.96		
	13:21										365.79	100	0.86		
	13:30										377	100	1.1		
				1.5	37.5	50	0	0	0	0					
IP-09	12:12		28-32	1.5	37.5	50					5	60	5		
	12:27										95.5	70	6.14		
	12:40										150	75	3.4		
	12:50										184.01	90	3.55		
	13:00										219.8	100	3.32		
	13:10										260.6	100	1.2		
	13:22										302.2	100	4.23		
	13:30										333.7	105	3.4		
	13:40										361.9	100	2.67		
	13:48										377	100	3.18		
				1.5	37.5	50	0	0	0	0					
IP-10	14:00		28-32	1.5	37.5	50					12.08	65	7.92		
	14:12										126.53	60	6.79		
	14:23										199.05	57	8.65		
	14:30										273.15	65	10.38		
	14:41										377	70	8.45		
				1.5	37.5	50	0	0	0	0					
6			0	9.00	225.00	300.00	0.00	0.00	0.00	906.00	0.00	74.76	3.691		

Injection Log

Project No.:	18035.01	Injected Products:	ELS	Inj. Tool:		Date: 3/28/2018
Client:	EA Engineering		EHC-L	Inj. Rig:	VGS-45 Flatbed 3-Axle 18,000 GVW (Trailer - 5th Wheel,	
Site Address:	11529 Jones Rd, Houston, TX		Sodium Bicarbonate	Drill Rig:	VGS-38 7822DT Geoprobe	Crew: AG PW TS
				Drill Rig:		

Injection location ID	Start Time	End Time:	Interval (Ft. BGS)	ELS (Drums)	EHC-L (lbs)	Sodium Bicarbonate (lbs)				Mixed H2O (gal)	Cumulative Injected (gal)	Avg PSI	Avg. Flow Rate (gpm)	Notes/Comments:	Flow & pressure Graphs
IP-01	8:09		28-32	1.5	37.5	62.5				679	0	25	0		
	8:22										12.4	37	5.6		
	8:33										65.08		4.38		
	8:41										88.66		5.46		
	9:10										110.3		6.39		
	9:30										133	46	6.65		
	9:40										212.6	48	7.01		
	9:46										282	75	9.13		
	10:02										363	75	5.45		
	10:27										412	22	5.12		
	10:40										475	25	4.6		
	10:56										548	55	4.6		
	11:10										603	45	8.55		
	11:20										680	50	8.01		
	11:30										755	50	8		
				1.5	37.5	62.5	0	0	0	679					
IP-02	8:10		28-32	1.5	37.5	62.5				679	5.9	30	0		
	8:23										14.5	45	4.84		
	8:34										55.96		3.72		
	8:40										72.05		6.78		
	9:10										92.8		6.41		
	9:31										118.99	60	6.57		
	9:40										191.01	50	7.32		
	9:46										257	70	9.8		
	10:03										350	70	6.32		
	10:28										410	65	8.38		
	10:41										500	55	7.85		
	10:56										598	65	7.65		
	11:10										675	65	6.98		
	11:20										754	58	6.02		
				1.5	37.5	62.5	0	0	0	679					
IP-03	8:11		28-32	1.5	37.5	62.5				679	7.47	26	0		
	8:23										20.5	37	5.03		
	8:34										56.12		4.88		
	8:41										75.56		1.38		
	9:10										96.5		5.12		
	9:31										123.01	50	7.16		
	9:41										184	70	4.96		
	9:46										196.2	75	1.82		
	10:03										213	65	1.5		
	10:29										255	70	1.16		
	10:57										261	75	0.46		
	11:10										267	50	0.7		
	11:20										275	45	2.33		
	11:30										305	70	2.95		
	11:45										336	65	4.05		
	12:00										396.9	68	5.55		
	12:15										481.2	70	5.39		
	12:35										567.1	75	6.07		
	12:47										687.6	75	6.45		
											757	70	4.35		
				1.5	37.5	62.5	0	0	0	679					
IP-04	8:11		28-32	1.5	37.5	62.5				679	0.91	28	0		
	8:23										19.8	40	4.86		
	8:34										52.8		3.69		
	8:41										66.08		4.88		
	9:10										77.8		6.5		
	9:31										112	58	7.25		
	9:41										169	70	4.06		
	9:46										183	80	1.52		
	10:04										197.5	90	1.5		
	10:30										205	85	1.12		
	10:58										216	85	0.71		
	11:10										227	90	0.75		
	11:20										238	85	2.24		
	11:30										274	90	4.71		
	11:45										323.05	90	4.89		
	12:00										404	95	4.8		
	12:15										477.2	90	5		
	12:35										556.2	89	4.68		
	12:55										648.88	92	6.01		
											765	95	7.37	COMPLETE - SYSTEM / TANK FRESH WATER FLUSH STARTED	
				1.5	37.5	62.5	0	0	0	679					
4			0	6.00	150.00	250.00	0.00	0.00	0.00	2716.00	0.00	63.0526	4.71652174		

7 FIELD NOTES

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Vista GeoScience Daily Drilling Services Report

This is NOT an invoice, but the information will be used for invoicing purposes.
To be completed at the end of each day and signed by Vista GeoScience and Client Representatives.

PROJECT INFORMATION	VISTA Project#: 18035.01 DATE: 3-26-18	RIG: 7730
Vista Field Engineers: JS, AG, JZ, PW	Utility Locate Ticket Number:	
Client: EA Engineering	Site Manager: John	
Client Project Name:	Client Project Number:	
Site Description: Parking Lot	Site Address: 11529 Jones Rd	

DAILY TIME REPORT	(use 24-hour clock)	Time Exceeded 4 Hr Min: YES / NO
Day Number: 1	Total Hours on Site: 8	Mobilization Mileage:
Time Requested on Location: 730	Client's Standby Hours:	To Site: 5
Time on Location: 730	- Vista's Standby Hours:	Return: 5
Time off Location: 1530	- Lunch / Break Hours:	Total: 10
Lunch Break - From: — To: —	= Total Bill Hours @ Level: [D]: 8	Drive Hours: .5
Standby Sessions (describe):		

EXPENDABLES USED AND DAMAGED TOOLS (circle or fill in bracketed items)

QTY	ITEM	QTY	ITEM
LINERS/TUBING		**ABANDONMENT MATERIALS**	
	[ ]' Soil Core Liners (ea) Type:		Bentonite [Granular], [Chip], [Powder] (50# bag)
	[ ]' Soil Core Liners (ea) Type:		Silica Sand (50# bag)
	Other Liners:[ ]		Portland Cement (94# bag)
	[1/4"] , [3/8"] or [1/2"] Polyethylene Tubing (ft)		[Asphalt Patch], [Concrete] (lb. bag)
	3/8" Silicone Tubing (ft)		
	Other Tubing:[ ]		
EXPENDABLES/PVC		**RENTAL EQUIPMENT/CONTRACT:**	
	[ ]" Expendable Points (ea):	2	Pump: [trash]
	[ ]" [Grip Anchor Point] or [Expendable Cutting Shoe] (circle)		[PID/OVM] or [LandTec]
	[ ]" x 5' PVC Riser (section) Sch [ ]		Exhaust Fan / Ductwork / CO Monitor
	[ ]" x 10' PVC Riser (section) Sch [ ]		Subcontracted Concrete Coring / Barricading
	[ ]" x 5' PVC Screen (section) Sch [ ]		3.25" Casing and Auger Add-On
	[ ]" x 10' PVC Screen (section) Sch [ ]		[Decon] or [Support] Trailer / Truck
	[ ]" TFJ PVC Plug/Cap (ea)		Gamma Logger
	[ ]" PVC Slip Cap (ea)		Core Drill: [ ]" x [ ]" x [ ]"
			Generator
SUPPLIES			
	[ ]" J-Plug and Lock (set)		
	[ ]" x [ ]' Prepacked Screen (ea)	**Additional Items Used / Damaged Tools / PPE:**	
	Flush-Mount Traffic Cover ["] Diameter		
	4" x 4" x 5' Sq. Steel Protective Well Cover/Riser		
	Concrete Anchor Bolts		
	[30] or [55] gallon Drum, each		

APPROVALS & SIGNATURES

Vista Field Engineer: Ted Slockwell   Client's Supervisor: John T Bo EA Eng

NOTES: No points completed due to lack of water meter   Samples Returned to Vista Lab ☐

OPS DPT footage:['] **OPS 1" Well Material Footage:[']** **OPS Auger Footage:[']** **OPS 2" Well Material Footage:[']**

#Total Test Holes:[ ] **#Cores:[ ]** **H2O Samples:[ ]** **Gamma Log Ft:[ ]** **Total Drilled Ft:[ ]** **Well Ft:[ ]** **#Wells:[ ]**

Vista GeoScience Daily Drilling Services Report

This is NOT an invoice, but the information will be used for invoicing purposes.
To be completed at the end of each day and signed by Vista GeoScience and Client Representatives.

PROJECT INFORMATION	VISTA Project#: 18035.01	DATE: 3-27-18	RIG: 7730
Vista Field Engineers: TS, AG, JZ, PW		Utility Locate Ticket Number:	
Client: EA Engineering		Site Manager: John	
Client Project Name:		Client Project Number:	
Site Description: Parking Lot		Site Address: 11529 Jones Rd	

DAILY TIME REPORT	(use 24-hour clock)	Time Exceeded 4 Hr Min: YES / NO
Day Number: 2	Total Hours on Site: 11	**Mobilization Mileage:**
Time Requested on Location:	Client's Standby Hours:	To Site: 5
Time on Location: 800	- Vista's Standby Hours:	Return: 5
Time off Location: 1700	- Lunch / Break Hours:	Total: 10
Lunch Break - From: — To: —	= Total Bill Hours @ Level: [D]: 11	Drive Hours: .5

Standby Sessions (describe):

EXPENDABLES USED AND DAMAGED TOOLS (circle or fill in bracketed items)

QTY	ITEM	QTY	ITEM
LINERS/TUBING		**ABANDONMENT MATERIALS**	
	[ ]' Soil Core Liners (ea) Type:	2	Bentonite [Granular], [Chip], [Powder] (50# bag)
	[ ]' Soil Core Liners (ea) Type:		Silica Sand (50# bag)
	Other Liners:[ ]		Portland Cement (94# bag)
	[1/4"], [3/8"] or [1/2"] Polyethylene Tubing (ft)		[Asphalt Patch], [Concrete] (lb. bag)
	3/8" Silicone Tubing (ft)		
	Other Tubing:[ ]		
EXPENDABLES/PVC		**RENTAL EQUIPMENT/CONTRACT:**	
6	[1.5]" Expendable Points (ea):	2	Pump: [trash]
	[ ]" [Grip Anchor Point] or [Expendable Cutting Shoe] (circle)		[PID/OVM] or [LandTec]
	[ ]" x 5' PVC Riser (section) Sch [ ]		Exhaust Fan / Ductwork / CO Monitor
	[ ]" x 10' PVC Riser (section) Sch [ ]		Subcontracted Concrete Coring / Barricading
	[ ]" x 5' PVC Screen (section) Sch [ ]		3.25" Casing and Auger Add-On
	[ ]" x 10' PVC Screen (section) Sch [ ]		[Decon] or [Support] Trailer / Truck
	[ ]" TFJ PVC Plug/Cap (ea)		Gamma Logger
	[ ]" PVC Slip Cap (ea)		Core Drill: [ ]" x [ ]" x [ ]"
			Generator
SUPPLIES			
	[ ]" J-Plug and Lock (set)		
	[ ]" x [ ]' Prepacked Screen (ea)	**Additional Items Used / Damaged Tools / PPE:**	
	Flush-Mount Traffic Cover ["] Diameter		
	4" x 4" x 5' Sq. Steel Protective Well Cover/Riser		
	Concrete Anchor Bolts		
	[30] or [55] gallon Drum, each		

APPROVALS & SIGNATURES

Vista Field Engineer: Ted Stockwell   Client's Supervisor: John Bow EA1D

NOTES: Points P5-10 finished   Samples Returned to Vista Lab ☐

OPS DPT footage:[ ] **OPS 1" Well Material Footage:**[ ] **OPS Auger Footage:**[ ] **OPS 2" Well Material Footage:**[ ]

#Total Test Holes:[ ] **#Cores:**[ ] **H2O Samples:**[ ] **Gamma Log Ft:**[ ] **Total Drilled Ft:**[ ] **Well Ft:**[ ] **#Wells:**[ ]

Vista GeoScience Daily Drilling Services Report

This is NOT an invoice, but the information will be used for invoicing purposes.
To be completed at the end of each day and signed by Vista GeoScience and Client Representatives.

PROJECT INFORMATION	VISTA Project#: 1803501 DATE: 7/28/18 RIG: 78
Vista Field Engineers: Peter W, Ted J, Tony G	Utility Locate Ticket Number:
Client: EA	Site Manager: John Donne
Client Project Name:	Client Project Number:
Site Description: Dry Cleaner Parking Lot	Site Address: 11529 Jones Road

DAILY TIME REPORT	(use 24-hour clock)	Time Exceeded 4 Hr Min: (YES) NO
Day Number: 3	Total Hours on Site: 11.25	Mobilization Mileage:
Time Requested on Location: ~~0700~~ 0645	Client's Standby Hours: 0	To Site: 8
Time on Location: ~~0700~~ 0645	- Vista's Standby Hours: 0	Return: 8
Time off Location: 1800	- Lunch / Break Hours: 0	Total: 16
Lunch Break - From: – To: –	= Total Bill Hours @ Level: [D]: 11.25	Drive Hours: .5

Standby Sessions (describe): –

EXPENDABLES USED AND DAMAGED TOOLS (circle or fill in bracketed items)

QTY	ITEM	QTY	ITEM
	LINERS/TUBING		**ABANDONMENT MATERIALS**
	[ ]' Soil Core Liners (ea) Type:	2	Bentonite [Granular], [Chip], [Powder] (50# bag)
	[ ]' Soil Core Liners (ea) Type:		Silica Sand (50# bag)
	Other Liners:[ ]		Portland Cement (94# bag)
	[1/4"], [3/8"] or [1/2"] Polyethylene Tubing (ft)	1	[Asphalt Patch], [Concrete] (80 lb. bag)
	3/8" Silicone Tubing (ft)		
	Other Tubing:[ ]		
	EXPENDABLES/PVC		**RENTAL EQUIPMENT/CONTRACT:**
4	[1.5]" Expendable Points (ea):		Pump: [ ]
	[ ]" [Grip Anchor Point] or [Expendable Cutting Shoe] (circle)		[PID/OVM] or [LandTec]
	[ ]" x 5' PVC Riser (section) Sch [ ]		Exhaust Fan / Ductwork / CO Monitor
	[ ]" x 10' PVC Riser (section) Sch [ ]		Subcontracted Concrete Coring / Barricading
	[ ]" x 5' PVC Screen (section) Sch [ ]		3.25" Casing and Auger Add-On
	[ ]" x 10' PVC Screen (section) Sch [ ]		[Decon] or [Support] Trailer / Truck
	[ ]" TFJ PVC Plug/Cap (ea)		Gamma Logger
	[ ]" PVC Slip Cap (ea)		Core Drill: [ ]" x [ ]" x [ ]"
		1	Generator trailer mounted
	SUPPLIES		
	[ ]" J-Plug and Lock (set)		
	[ ]" x [ ]' Prepacked Screen (ea)		**Additional Items Used / Damaged Tools / PPE:**
	Flush-Mount Traffic Cover ["] Diameter		White Dry Tele
	4" x 4" x 5' Sq. Steel Protective Well Cover/Riser		Rental Forklift
	Concrete Anchor Bolts		Fence rental
	[30] or [55] gallon Drum, each		

APPROVALS & SIGNATURES

Vista Field Engineer: [signature] Client's Supervisor: John Donne EA Eng

NOTES: Samples Returned to Vista Lab ☐

Inject IP01, 02, 03, 04

OPS DPT footage:[ ] OPS 1" Well Material Footage:[ ] OPS Auger Footage:[ ] OPS 2" Well Material Footage:[ ]

#Total Test Holes:[ ] #Cores:[ ] H2O Samples:[ ] Gamma Log Ft:[ ] Total Drilled Ft:[ ] Well Ft:[ ] #Wells:[ ]

Vista GeoScience Daily Drilling Services Report

This is NOT an invoice, but the information will be used for invoicing purposes.
To be completed at the end of each day and signed by Vista GeoScience and Client Representatives.

PROJECT INFORMATION	VISTA Project#: 18035.01 DATE: 3/29/18 RIG: 7822 DT
Vista Field Engineers: DW, TS, AG	Utility Locate Ticket Number: White lnj. trk
Client: EA engineering	Site Manager: John Bonner
Client Project Name:	Client Project Number:
Site Description: Parking Lot	Site Address: 11529 Jones RD

DAILY TIME REPORT	(use 24-hour clock)	Time Exceeded 4 Hr Min: YES / NO
Day Number: 4	Total Hours on Site: 4	Mobilization Mileage:
Time Requested on Location: 0700	Client's Standby Hours: /	To Site:
Time on Location: 0700	- Vista's Standby Hours: /	Return:
Time off Location: 1100	- Lunch / Break Hours: /	Total:
Lunch Break - From: / To: /	= Total Bill Hours @ Level: [ ]: 4	Drive Hours:

Standby Sessions (describe):

EXPENDABLES USED AND DAMAGED TOOLS (circle or fill in bracketed items)

QTY	ITEM	QTY	ITEM
LINERS/TUBING		**ABANDONMENT MATERIALS**	
/	[ ]' Soil Core Liners (ea) Type:	/	Bentonite [Granular], [Chip], [Powder] (50# bag)
	[ ]' Soil Core Liners (ea) Type:		Silica Sand (50# bag)
	Other Liners:[ ]		Portland Cement (94# bag)
	[1/4"] , [3/8"] or [1/2"] Polyethylene Tubing (ft)		[Asphalt Patch], [Concrete] (lb. bag)
	3/8" Silicone Tubing (ft)		
	Other Tubing:[ ]		
EXPENDABLES/PVC		**RENTAL EQUIPMENT/CONTRACT:**	
/	[ ]" Expendable Points (ea):	/	Pump: [ ]
	[ ]" [Grip Anchor Point] or [Expendable Cutting Shoe] (circle)		[PID/OVM] or [LandTec]
	[ ]" x 5' PVC Riser (section) Sch [ ]		Exhaust Fan / Ductwork / CO Monitor
	[ ]" x 10' PVC Riser (section) Sch [ ]		Subcontracted Concrete Coring / Barricading
	[ ]" x 5' PVC Screen (section) Sch [ ]		3.25" Casing and Auger Add-On
	[ ]" x 10' PVC Screen (section) Sch [ ]		[Decon] or [Support] Trailer / Truck
	[ ]" TFJ PVC Plug/Cap (ea)		Gamma Logger
	[ ]" PVC Slip Cap (ea)		Core Drill: [ ]" x [ ]" x [ ]"
			Generator
SUPPLIES			
/	[ ]" J-Plug and Lock (set)		
	[ ]" x [ ]' Prepacked Screen (ea)	**Additional Items Used / Damaged Tools / PPE:**	
	Flush-Mount Traffic Cover ["] Diameter	1	forklift rental
	4" x 4" x 5' Sq. Steel Protective Well Cover/Riser		
	Concrete Anchor Bolts		
	[30] or [55] gallon Drum, each		

APPROVALS & SIGNATURES

Vista Field Engineer: [signature] Client's Supervisor: [signature] EA Eng

NOTES: Samples Returned to Vista Lab ☐

Cleaned up site, broke down fence and finished all little things necessary.

OPS DPT footage:['] OPS 1" Well Material Footage:['] OPS Auger Footage:['] OPS 2" Well Material Footage:[']

#Total Test Holes:[ ] #Cores:[ ] H2O Samples:[ ] Gamma Log Ft:[ ] Total Drilled Ft:[ ] Well Ft:[ ] #Wells:[ ]

Expert Environmental
Support Services for Site
Investigation & Remediation

August 18, 2016

Patrick Appel
EA Engineering, Science, and Technology, LLC
405 South Highway 121, Building C, Suite 100
Lewisville, TX 75067

Via E-Mail: mailto:pappel@eaest.com

RE: DRAFT REPORT; Vista GeoScience Project No. 15250.02
Jones Road Superfund Site, EHC Liquid ISCR Reagent Injections

Dear Patrick:

Enclosed is Vista's summary remediation and injection application report for the above referenced project. The report includes a project overview, pre-mobilization and injection activities, summary tables and charts, injections logs, and site photos.

We will be anxious to hear any feedback from you as well as post-injection monitoring data you can provide. We truly appreciate providing these services to EA Engineering and look forward to working with you again on your future projects.

Please feel to call us if you have any questions or comments regarding this report.

Sincerely,

TJ Haley

TJ Haley
Gulf Coast Regional Manager
tjhaley@vistageoscience.com

Draft Report

EHC - Liquid In-Situ Injection,
Jones Road Superfund Site
Harris County, Texas
EPA Identification No. TXN000605460

Prepared for:

EA Engineering, Science, and Technology
Lewisville, Texas
March 2016

TABLE OF CONTENTS

Application of EHC-L Solution at Jones Road Superfund Site, Houston, Texas

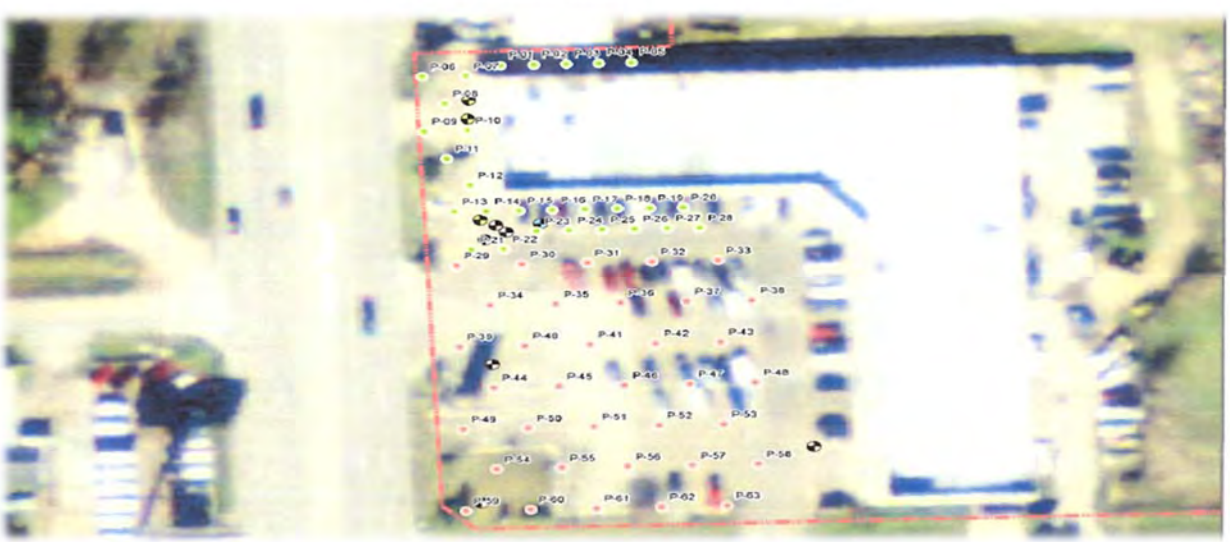
1. Background and Project Overview

EA contracted Vista Geoscience (Vista) to install Peroxy Chem's EHC-Liquid ISCR Reagent (EHC-L) solution for remediation of contaminants at the Jones Road Superfund Site located at 11600 Jones Road Houston TX, starting on January 22nd and continuing through February 3rd of 2016.

The site is located in the northwest portion of Harris County, Texas. The source of site contamination is the former Bell Dry Cleaners facility, which was located within the Cypress Shopping Center at 11600 Jones Road, approximately 0.5 miles north of the intersection of Jones Road and Farm to Market (FM) 1960, outside the city limits of northwest Houston, Texas. The Cypress Shopping Center was constructed in 1984, and the former Bell facility began dry cleaning operations sometime in 1988, using perchloroethylene (PCE). The former Bell facility continued operating through May 2002 when the dry cleaning operations were shut down. Hazardous substances present at the site include PCE, and related daughter products including trichloroethylene (TCE), cis-1,2-dichloroethylene (DCE), and vinyl chloride (VC).

The site has undergone numerous investigations beginning in 1994 and continuing through 2008. The site was proposed to the National Priorities List (NPL) on 30 April 2003, and was finalized to the NPL on 29 September 2003. From August 2003 through May 2008, the Texas Commission on Environmental Quality's (TCEQ's) state-lead contractor performed a remedial investigation (RI) and feasibility study at the site, which characterized the nature and extent of constituents present in environmental media at the site. During the RI, 19 monitoring wells were installed across the area of the site (Figure 2). Soil, ground water, and vapor intrusion samples were collected, and a bench scale treatability study was completed to evaluate the application of in situ chemical oxidation and bioremediation treatment technologies. Routine quarterly ground water sampling was also performed.

Site air photo with injection locations



2. Pre-Mobilization Activities

All applicable licenses, insurance, MSDS, JSA, and health and safety plans from Vista Geoscience were provided and reviewed by EA prior to mobilizing to the site on January 22nd 2016.

On January 22nd 2016 Vista mobilized to the Jones Road Superfund site located at 11600 Jones Road Houston Texas for pre-injection project activities. The activities are listed below.

- Staging of Injection Equipment.
- Set up of Security fence with privacy screen, around staging and mixing area.
- Private Locates conducted by Advanced Utility Locating Services
- Received mixing and holding tanks
- Set up mixing and transfer pumps.
- Filling of Water tanks.
- Adding amendments to water to assist with removing oxygen from the water.
- Received partial shipment of chemicals.

Over the next couple of days Vista mixed and prepared injection solutions so that dissolved oxygen (DO) levels were below 0.5 milligrams per liter and oxidation reduction potential (ORP) was less than 0 mV and negative. This was achieved by adding EHC-L at a rate of 1 gallon per thousand gallons of water. Vista also added sodium sulfite at the rate of .005 pounds per gallon of water. DO and ORP parameters dropped within the 24 hours specified by EA in the scope of work.

Injection Staging and mixing area

3. Injection Event

1.1 Mobilization and Site Preparation

Vista mobilized the remaining injection equipment to 11600 Jones Road on January 25th, 2016 including the custom Clean-Inject™ slurry remediation unit, a track mounted Geoprobe 7822DT, a track mounted Geoprobe 6610DT direct push rig with direct-push injection tooling, a 40 HR HAZWOPER trained crew, and site work zone delineation equipment. The site was secured using highly visible road cones with caution tape, injection hose ramps and an exclusion area was marked off. The Vista Crew met with EA project team members to locate and identify the injection locations, participate in the Vista health and safety meeting and review the injection process.

The first day was spent checking DO and ORP levels in the mixing and water holding tanks, completion of the mixing and transfer systems, and transferring EHC-L solution to mixing tank. Unloading and staging of injection hoses and injection tooling.

The EHC-L mixture was deemed thicker than first anticipated. Due to this, anaerobic water was added to the drums of EHC-L and mixed with a paddle mixer on a hand held drill prior to being transferred with a 2-inch trash pump and a 1-inch air diagram pump into the recirculation line of the mixing tank to help sheer it up. Once the right amount of EHC-L was reached, the EHC-L dry mix and potassium bicarbonate was added using the same mixing and transfer procedure as the EHC-L. The total mixture was allowed to recirculate from the bottom of the tank through a 2-inch hose back to the bottom of the tank to not allow for the re-introduction of oxygen to the solution.

Figure 1

After the solution was allowed to recirculate for at least 10 minutes, the DO and ORP levels were again checked to insure they did not change or go up after mixing. Once it was deemed those levels where within specifications, the appropiate amount of Dehalococcoides (DHC) inoculum was added.

The injection locations were separated into two different areas, A and B. Each area had a different ratio of the EHC-L product to water and different injection intervals (see Table 1). The target injection intervals were four foot thick zones, so Vista utilized a 1.5" custom retractable injection tool with a four foot stainless steel wire wrapped screen. Injections were monitored using digital flow and pressure gauges, and were documented by the operator. Less than one gallon of surfacing was experienced at some of the locations. Each location was started individually and with increased pressure in 5 PSI increments. See the attached injection logs in Appendix A for individual flows, volumes, and notes. After injections were completed, boring locations were backfilled with bentonite and patched with concrete to match the existing surface. Any spilled product was vacuumed up and used for re-injection after being screened for solids and debris.

Table 1. Injection Summary Table

		Injection Interval		Injectate Mixture					Total Volume
	Point	Top ft bgs	Bottom ft bgs	Water (gal)	EHC-L (drum)	Dry Mix (lbs)	$KHCO_3$ (lbs)	DHC Liters	Injection (gal)
A-Injection Points	P-01	28	32	400	2	100	44	0.9	505
	P-02	28	32	400	2	100	44	0.9	505
	P-03	28	32	400	2	100	44	0.9	505
	P-04	28	32	400	2	100	44	0.9	505
	P-05	28	32	400	2	100	44	0.9	505
	P-06	28	32	400	2	100	44	0.9	505
	P-07	28	32	400	2	100	44	0.9	505
	P-08	28	32	400	2	100	44	0.9	505
	P-09	28	32	400	2	100	44	0.9	505
	P-10	28	32	400	2	100	44	0.9	505
	P-11	28	32	400	2	100	44	0.9	505
	P-12	27	31	400	2	100	44	0.9	505
	P-13	27	31	400	2	100	44	0.9	505
	P-14	27	31	400	2	100	44	0.9	505
	P-15	27	31	400	2	100	44	0.9	505
	P-16	27	31	400	2	100	44	0.9	505
	P-17	27	31	400	2	100	44	0.9	505
	P-18	27	31	400	2	100	44	0.9	505
	P-19	27	31	400	2	100	44	0.9	505
	P-20	27	31	400	2	100	44	0.9	505
	P-21	27	31	400	2	100	44	0.9	505
	P-22	27	31	400	2	100	44	0.9	505
	P-23	27	31	400	2	100	44	0.9	505
	P-24	27	31	400	2	100	44	0.9	505
	P-25	27	31	400	2	100	44	0.9	505
	P-26	27	31	400	2	100	44	0.9	505
	P-27	27	31	400	2	100	44	0.9	505
	P-28	27	31	400	2	100	44	0.9	505

		Injection Interval		Injectate Mixture					Total Volume
	Point	Top ft bgs	Bottom ft bgs	Water (gal)	EHC-L (drum)	Dry Mix (lbs)	$KHCO_3$ (lbs)	DHC Liters	Injection (gal)
B-Injection Points	P-29	28	32	850	2	100	88	1.8	955
	P-30	28	32	850	2	100	88	1.8	955
	P-31	28	32	850	2	100	88	1.8	955
	P-32	28	32	850	2	100	88	1.8	955
	P-33	28	32	850	2	100	88	1.8	955
	P-34	29	33	850	2	100	88	1.8	955
	P-35	29	33	850	2	100	88	1.8	955
	P-36	29	33	850	2	100	88	1.8	955
	P-37	29	33	850	2	100	88	1.8	955
	P-38	29	33	850	2	100	88	1.8	955
	P-39	29	33	850	2	100	88	1.8	955
	P-40	29	33	850	2	100	88	1.8	955
	P-41	29	33	850	2	100	88	1.8	955
	P-42	29	33	850	2	100	88	1.8	955
B-Injection Points	P-43	29	33	850	2	100	88	1.8	955
	P-44	29	33	850	2	100	88	1.8	955
	P-45	29	33	850	2	100	88	1.8	955
	P-46	29	33	850	2	100	88	1.8	955
	P-47	29	33	850	2	100	88	1.8	955
	P-48	29	33	850	2	100	88	1.8	955
	P-49	29	33	850	2	100	88	1.8	955
	P-50	29	33	850	2	100	88	1.8	955
	P-51	29	33	850	2	100	88	1.8	955
	P-52	29	33	850	2	100	88	1.8	955
	P-53	29	33	850	2	100	88	1.8	955
	P-54	29	33	850	2	100	88	1.8	955
	P-55	29	33	850	2	100	88	1.8	955
	P-56	29	33	850	2	100	88	1.8	955
	P-57	29	33	850	2	100	88	1.8	955
	P-58	29	33	850	2	100	88	1.8	955
	P-59	29	33	850	2	100	88	1.8	955
	P-60	50	54	850	2	100	88	1.8	955
	P-61	50	54	850	2	100	88	1.8	955
	P-62	50	54	850	2	100	88	1.8	955
	P-63	50	54	850	2	100	88	1.8	955

1.2 Area A

Area	Injection Points	Date Started	Date Completed	Top of Injection Interval	Bottom of Injection Interval	Interval Length	Target Water (gal)	EHC - L (gal)	Target Dry Mix (lbs)	Target KHCO3 (lbs)	Target DHC (lts)	Target Total Volume (gal)
A	P - 01	1/29/16	1/29/16	28	32	4	400.0	100.0	50.0	44.0	0.9	505.0
	P - 02	1/30/16	1/30/16	28	32	4	400.0	100.0	50.0	44.0	0.9	505.0
	P - 03	1/29/16	1/29/16	28	32	4	400.0	100.0	50.0	44.0	0.9	505.0
	P - 04	1/29/16	1/29/16	28	32	4	400.0	100.0	50.0	44.0	0.9	505.0
	P - 05	1/29/16	1/29/16	28	32	4	400.0	100.0	50.0	44.0	0.9	505.0
	P - 06	1/29/16	1/29/16	28	32	4	400.0	100.0	50.0	44.0	0.9	505.0
	P - 07	1/29/16	1/29/16	28	32	4	400.0	100.0	50.0	44.0	0.9	505.0
	P - 08	1/29/16	1/29/16	28	32	4	400.0	100.0	50.0	44.0	0.9	505.0
	P - 09	1/29/16	1/29/16	28	32	4	400.0	100.0	50.0	44.0	0.9	505.0
	P - 10	1/29/16	1/29/16	28	32	4	400.0	100.0	50.0	44.0	0.9	505.0
	P - 11	1/29/16	1/29/16	28	32	4	400.0	100.0	50.0	44.0	0.9	505.0
	P - 12	1/29/16	1/29/16	27	31	4	400.0	100.0	50.0	44.0	0.9	505.0
	P - 13	1/30/16	1/30/16	27	31	4	400.0	100.0	50.0	44.0	0.9	505.0
	P - 14	1/28/16	1/28/16	27	31	4	400.0	100.0	50.0	44.0	0.9	505.0
	P - 15	1/28/16	1/28/16	27	31	4	400.0	100.0	50.0	44.0	0.9	505.0
	P - 16	1/28/16	1/28/16	27	31	4	400.0	100.0	50.0	44.0	0.9	505.0
	P - 17	1/28/16	1/28/16	27	31	4	400.0	100.0	50.0	44.0	0.9	505.0
	P - 18	1/28/16	1/28/16	27	31	4	400.0	100.0	50.0	44.0	0.9	505.0
	P - 19	1/29/16	1/29/16	27	31	4	400.0	100.0	50.0	44.0	0.9	505.0
	P - 20	1/28/16	1/28/16	27	31	4	400.0	100.0	50.0	44.0	0.9	505.0
	P - 21	1/30/16	1/30/16	27	31	4	400.0	100.0	50.0	44.0	0.9	505.0
	P - 22	1/30/16	1/30/16	27	31	4	400.0	100.0	50.0	44.0	0.9	505.0
	P - 23	1/28/16	1/28/16	27	31	4	400.0	100.0	50.0	44.0	0.9	505.0
	P - 24	1/28/16	1/28/16	27	31	4	400.0	100.0	50.0	44.0	0.9	505.0
	P - 25	1/28/16	1/28/16	27	31	4	400.0	100.0	50.0	44.0	0.9	505.0
	P - 26	1/29/16	1/29/16	27	31	4	400.0	100.0	50.0	44.0	0.9	505.0
	P - 27	1/29/16	1/29/16	27	31	4	400.0	100.0	50.0	44.0	0.9	505.0
	P - 28	1/28/16	1/28/16	27	31	4	400.0	100.0	50.0	44.0	0.9	505.0
	Area Totals						11200.0	2800.0	1400.0	1232.0	25.2	14140.0

1.3 Area B

Area	Injection Points	Date Started	Date Completed	Top of Injection Interval	Bottom of Injection Interval	Interval Length	Target Water (gal)	EHC - L (gal)	Target Dry Mix (lbs)	Target KHCO3 (lbs)	Target DHC (lts)	Target Total Volume (gal)
B	P - 29	1/27/16	1/27/16	28	32	4	850.0	100.0	50.0	88.0	1.8	955.0
	P - 30	1/30/16	1/30/16	28	32	4	850.0	100.0	50.0	88.0	1.8	955.0
	P - 31	1/27/16	1/27/16	28	32	4	850.0	100.0	50.0	88.0	1.8	955.0
	P - 32	1/30/16	1/30/16	28	32	4	850.0	100.0	50.0	88.0	1.8	955.0
	P - 33	1/27/16	1/27/16	28	32	4	850.0	100.0	50.0	88.0	1.8	955.0
	P - 34	1/27/16	1/27/16	29	33	4	850.0	100.0	50.0	88.0	1.8	955.0
	P - 35	1/30/16	1/30/16	29	33	4	850.0	100.0	50.0	88.0	1.8	955.0
	P - 36	1/30/16	1/30/16	29	33	4	850.0	100.0	50.0	88.0	1.8	955.0
	P - 37	1/31/16	1/31/16	29	33	4	850.0	100.0	50.0	88.0	1.8	955.0
	P - 38	1/31/16	1/31/16	29	33	4	850.0	100.0	50.0	88.0	1.8	955.0
	P - 39	1/26/16	1/26/16	29	33	4	850.0	100.0	50.0	88.0	1.8	955.0
	P - 40	2/1/16	2/1/16	29	33	4	850.0	100.0	50.0	88.0	1.8	955.0
	P - 41	1/26/16	1/26/16	29	33	4	850.0	100.0	50.0	88.0	1.8	955.0
	P - 42	1/31/16	1/31/16	29	33	4	850.0	100.0	50.0	88.0	1.8	955.0
	P - 43	1/26/16	1/26/16	29	33	4	850.0	100.0	50.0	88.0	1.8	955.0
	P - 44	2/1/16	2/1/16	29	33	4	850.0	100.0	50.0	88.0	1.8	955.0
	P - 45	2/1/16	2/1/16	29	33	4	850.0	100.0	50.0	88.0	1.8	955.0
	P - 46	2/1/16	2/1/16	29	33	4	850.0	100.0	50.0	88.0	1.8	955.0
	P - 47	1/31/16	1/31/16	29	33	4	850.0	100.0	50.0	88.0	1.8	955.0
	P - 48	1/27/16	1/27/16	29	33	4	850.0	100.0	50.0	88.0	1.8	955.0
	P - 49	2/1/16	2/1/16	29	33	4	850.0	100.0	50.0	88.0	1.8	955.0
	P - 50	2/1/16	2/1/16	29	33	4	850.0	100.0	50.0	88.0	1.8	955.0
	P - 51	1/31/16	1/31/16	29	33	4	850.0	100.0	50.0	88.0	1.8	955.0
	P - 52	1/27/16	1/27/16	29	33	4	850.0	100.0	50.0	88.0	1.8	955.0
	P - 53	1/26/16	1/26/16	29	33	4	850.0	100.0	50.0	88.0	1.8	955.0
	P - 54	2/1/16	2/1/16	29	33	4	850.0	100.0	50.0	88.0	1.8	955.0
	P - 55	1/26/16	1/26/16	29	33	4	850.0	100.0	50.0	88.0	1.8	955.0
	P - 56	1/31/16	1/31/16	29	33	4	850.0	100.0	50.0	88.0	1.8	955.0
	P - 57	1/26/16	1/26/16	29	33	4	850.0	100.0	50.0	88.0	1.8	955.0
	P - 58	1/31/16	1/31/16	29	33	4	850.0	100.0	50.0	88.0	1.8	955.0
	P - 59	1/27/16	1/27/16	46	50	4	850.0	100.0	50.0	88.0	1.8	955.0
	P - 60	1/27/16	1/27/16	50	54	4	850.0	100.0	50.0	88.0	1.8	955.0
	P - 61	1/26/16	1/26/16	50	54	4	850.0	100.0	50.0	88.0	1.8	955.0
	P - 62	1/31/16	1/31/16	50	54	4	850.0	100.0	50.0	88.0	1.8	955.0
	P - 63	1/26/16	1/26/16	50	54	4	850.0	100.0	50.0	88.0	1.8	955.0
	Area Totals						29750.0	3500.0	1750.0	3080.0	63.0	33425.0

4. Summary

A total of 6,489 gallons of EHC-L, 3,344 pounds of EHC-L Dry Mix, 4,798 pounds of potassium bicarbonate, 108 liters of DHC, and 40,948 gallons of water were injected into the 63 locations over eight days. The injections and site cleanup were concluded on February 2nd after which all equipment and debris were mobilized offsite.

Appendix A: Project Photos

Cleaning Out EHC-L Drums

Injection set up – Area A

Multiple Point Injection Manifold

Injection set up – Area B

Flow meters

Protective Hose Ramps

Appendix B: Injection Logs

Area	Injection Points	Date Started	Date Completed	Top of Injection Interval	Bottom of Injection Interval	Interval Lentgh	Target Water (gal)	EHC - L (gal)	Target Dry Mix (lbs)	Target KHCO3 (lbs)	Target DHC (lts)	Target Total Volume (gal)	Actual Water Injected (gal)	Difference	Actual EHC - L Injected	Difference	Actual Dry Mix Injected (lbs)	Difference	Actual KHCO3 Injected	Difference	Actual DHC Injected (lts)	Difference	Actual Total Volume Injected	Difference
A	P - 01	1/29/16	1/29/16	28	32	4	400.0	100.0	50.0	44.0	0.9	505.0	400.0	0.0	100.0	0.0	50.0	0.0	44.0	0.0	0.9	0.0	505.0	0.0
	P - 02	1/30/16	1/30/16	28	32	4	400.0	100.0	50.0	44.0	0.9	505.0	400.0	0.0	100.0	0.0	50.0	0.0	44.0	0.0	0.9	0.0	505.0	0.0
	P - 03	1/29/16	1/29/16	28	32	4	400.0	100.0	50.0	44.0	0.9	505.0	400.0	0.0	100.0	0.0	50.0	0.0	44.0	0.0	0.9	0.0	505.0	0.0
	P - 04	1/29/16	1/29/16	28	32	4	400.0	100.0	50.0	44.0	0.9	505.0	400.0	0.0	100.0	0.0	50.0	0.0	44.0	0.0	0.9	0.0	505.0	0.0
	P - 05	1/29/16	1/29/16	28	32	4	400.0	100.0	50.0	44.0	0.9	505.0	400.0	0.0	100.0	0.0	50.0	0.0	44.0	0.0	0.9	0.0	505.0	0.0
	P - 06	1/29/16	1/29/16	28	32	4	400.0	100.0	50.0	44.0	0.9	505.0	400.0	0.0	100.0	0.0	50.0	0.0	44.0	0.0	0.9	0.0	505.0	0.0
	P - 07	1/29/16	1/29/16	28	32	4	400.0	100.0	50.0	44.0	0.9	505.0	400.0	0.0	100.0	0.0	50.0	0.0	44.0	0.0	0.9	0.0	505.0	0.0
	P - 08	1/29/16	1/29/16	28	32	4	400.0	100.0	50.0	44.0	0.9	505.0	400.0	0.0	100.0	0.0	50.0	0.0	44.0	0.0	0.9	0.0	505.0	0.0
	P - 09	1/29/16	1/29/16	28	32	4	400.0	100.0	50.0	44.0	0.9	505.0	400.0	0.0	100.0	0.0	50.0	0.0	44.0	0.0	0.9	0.0	505.0	0.0
	P - 10	1/29/16	1/29/16	28	32	4	400.0	100.0	50.0	44.0	0.9	505.0	400.0	0.0	100.0	0.0	50.0	0.0	44.0	0.0	0.9	0.0	505.0	0.0
	P - 11	1/29/16	1/29/16	28	32	4	400.0	100.0	50.0	44.0	0.9	505.0	400.0	0.0	100.0	0.0	50.0	0.0	44.0	0.0	0.9	0.0	505.0	0.0
	P - 12	1/29/16	1/29/16	27	31	4	400.0	100.0	50.0	44.0	0.9	505.0	400.0	0.0	100.0	0.0	50.0	0.0	44.0	0.0	0.9	0.0	505.0	0.0
	P - 13	1/30/16	1/30/16	27	31	4	400.0	100.0	50.0	44.0	0.9	505.0	400.0	0.0	100.0	0.0	50.0	0.0	44.0	0.0	0.9	0.0	505.0	0.0
	P - 14	1/28/16	1/28/16	27	31	4	400.0	100.0	50.0	44.0	0.9	505.0	400.0	0.0	100.0	0.0	50.0	0.0	44.0	0.0	0.9	0.0	505.0	0.0
	P - 15	1/28/16	1/28/16	27	31	4	400.0	100.0	50.0	44.0	0.9	505.0	400.0	0.0	100.0	0.0	50.0	0.0	44.0	0.0	0.9	0.0	505.0	0.0
	P - 16	1/28/16	1/28/16	27	31	4	400.0	100.0	50.0	44.0	0.9	505.0	400.0	0.0	100.0	0.0	50.0	0.0	44.0	0.0	0.9	0.0	505.0	0.0
	P - 17	1/28/16	1/28/16	27	31	4	400.0	100.0	50.0	44.0	0.9	505.0	400.0	0.0	100.0	0.0	50.0	0.0	44.0	0.0	0.9	0.0	505.0	0.0
	P - 18	1/28/16	1/28/16	27	31	4	400.0	100.0	50.0	44.0	0.9	505.0	400.0	0.0	100.0	0.0	50.0	0.0	44.0	0.0	0.9	0.0	505.0	0.0
	P - 19	1/29/16	1/29/16	27	31	4	400.0	100.0	50.0	44.0	0.9	505.0	400.0	0.0	100.0	0.0	50.0	0.0	44.0	0.0	0.9	0.0	505.0	0.0
	P - 20	1/28/16	1/28/16	27	31	4	400.0	100.0	50.0	44.0	0.9	505.0	400.0	0.0	100.0	0.0	50.0	0.0	44.0	0.0	0.9	0.0	505.0	0.0
	P - 21	1/30/16	1/30/16	27	31	4	400.0	100.0	50.0	44.0	0.9	505.0	400.0	0.0	100.0	0.0	50.0	0.0	44.0	0.0	0.9	0.0	505.0	0.0
	P - 22	1/30/16	1/30/16	27	31	4	400.0	100.0	50.0	44.0	0.9	505.0	400.0	0.0	100.0	0.0	50.0	0.0	44.0	0.0	0.9	0.0	505.0	0.0
	P - 23	1/28/16	1/28/16	27	31	4	400.0	100.0	50.0	44.0	0.9	505.0	400.0	0.0	100.0	0.0	50.0	0.0	44.0	0.0	0.9	0.0	505.0	0.0
	P - 24	1/28/16	1/28/16	27	31	4	400.0	100.0	50.0	44.0	0.9	505.0	400.0	0.0	100.0	0.0	50.0	0.0	44.0	0.0	0.9	0.0	505.0	0.0
	P - 25	1/28/16	1/28/16	27	31	4	400.0	100.0	50.0	44.0	0.9	505.0	400.0	0.0	100.0	0.0	50.0	0.0	44.0	0.0	0.9	0.0	505.0	0.0
	P - 26	1/29/16	1/29/16	27	31	4	400.0	100.0	50.0	44.0	0.9	505.0	400.0	0.0	100.0	0.0	50.0	0.0	44.0	0.0	0.9	0.0	505.0	0.0
	P - 27	1/29/16	1/29/16	27	31	4	400.0	100.0	50.0	44.0	0.9	505.0	400.0	0.0	100.0	0.0	50.0	0.0	44.0	0.0	0.9	0.0	505.0	0.0
	P - 28	1/28/16	1/28/16	27	31	4	400.0	100.0	50.0	44.0	0.9	505.0	400.0	0.0	100.0	0.0	50.0	0.0	44.0	0.0	0.9	0.0	505.0	0.0
	Area Totals						11200.0	2800.0	1400.0	1232.0	25.2	14140.0	11200.0	0.0	2800.0	0.0	1400.0	0.0	1232.0	0.0	25.2	0.0	14140.0	0.0

Area	Injection Points	Date Started	Date Completed	Top of Injection Interval	Bottom of Injection Interval	Interval Lentgh	Target Water (gal)	EHC - L (gal)	Target Dry Mix (lbs)	Target KHCO3 (lbs)	Target DHC (lts)	Target Total Volume (gal)	Actual Water Injected (gal)	Difference	Actual EHC - L Injected	Difference	Actual Dry Mix Injected (lbs)	Difference	Actual KHCO3 Injected	Difference	Actual DHC Injected (lts)	Difference	Actual Total Volume Injected	Difference
B	P - 29	1/27/16	1/27/16	28	32	4	850.0	100.0	50.0	88.0	1.8	955.0	850.0	0.0	100.0	0.0	50.0	0.0	88.0	0.0	1.8	0.0	955.0	0.0
	P - 30	1/30/16	1/30/16	28	32	4	850.0	100.0	50.0	88.0	1.8	955.0	850.0	0.0	100.0	0.0	50.0	0.0	88.0	0.0	1.8	0.0	955.0	0.0
	P - 31	1/27/16	1/27/16	28	32	4	850.0	100.0	50.0	88.0	1.8	955.0	850.0	0.0	100.0	0.0	50.0	0.0	88.0	0.0	1.8	0.0	955.0	0.0
	P - 32	1/30/16	1/30/16	28	32	4	850.0	100.0	50.0	88.0	1.8	955.0	850.0	0.0	100.0	0.0	50.0	0.0	88.0	0.0	1.8	0.0	955.0	0.0
	P - 33	1/27/16	1/27/16	28	32	4	850.0	100.0	50.0	88.0	1.8	955.0	850.0	0.0	100.0	0.0	50.0	0.0	88.0	0.0	1.8	0.0	955.0	0.0
	P - 34	1/27/16	1/27/16	29	33	4	850.0	100.0	50.0	88.0	1.8	955.0	850.0	0.0	100.0	0.0	50.0	0.0	88.0	0.0	1.8	0.0	955.0	0.0
	P - 35	1/30/16	1/30/16	29	33	4	850.0	100.0	50.0	88.0	1.8	955.0	850.0	0.0	100.0	0.0	50.0	0.0	88.0	0.0	1.8	0.0	955.0	0.0
	P - 36	1/30/16	1/30/16	29	33	4	850.0	100.0	50.0	88.0	1.8	955.0	850.0	0.0	100.0	0.0	50.0	0.0	88.0	0.0	1.8	0.0	955.0	0.0
	P - 37	1/31/16	1/31/16	29	33	4	850.0	100.0	50.0	88.0	1.8	955.0	850.0	0.0	100.0	0.0	50.0	0.0	88.0	0.0	1.8	0.0	955.0	0.0
	P - 38	1/31/16	1/31/16	29	33	4	850.0	100.0	50.0	88.0	1.8	955.0	850.0	0.0	100.0	0.0	50.0	0.0	88.0	0.0	1.8	0.0	955.0	0.0
	P - 39	1/26/16	1/26/16	29	33	4	850.0	100.0	50.0	88.0	1.8	955.0	850.0	0.0	100.0	0.0	50.0	0.0	88.0	0.0	1.8	0.0	955.0	0.0
	P - 40	2/1/16	2/1/16	29	33	4	850.0	100.0	50.0	88.0	1.8	955.0	850.0	0.0	100.0	0.0	50.0	0.0	88.0	0.0	1.8	0.0	955.0	0.0
	P - 41	1/26/16	1/26/16	29	33	4	850.0	100.0	50.0	88.0	1.8	955.0	850.0	0.0	100.0	0.0	50.0	0.0	88.0	0.0	1.8	0.0	955.0	0.0
	P - 42	1/31/16	1/31/16	29	33	4	850.0	100.0	50.0	88.0	1.8	955.0	850.0	0.0	100.0	0.0	50.0	0.0	88.0	0.0	1.8	0.0	955.0	0.0
	P - 43	1/26/16	1/26/16	29	33	4	850.0	100.0	50.0	88.0	1.8	955.0	850.0	0.0	100.0	0.0	50.0	0.0	88.0	0.0	1.8	0.0	955.0	0.0
	P - 44	2/1/16	2/1/16	29	33	4	850.0	100.0	50.0	88.0	1.8	955.0	850.0	0.0	163.0	-63.0	115.0	-65.0	250.0	-162.0	8.3	-6.5	1033.0	-78.0
	P - 45	2/1/16	2/1/16	29	33	4	850.0	100.0	50.0	88.0	1.8	955.0	850.0	0.0	163.0	-63.0	115.0	-65.0	250.0	-162.0	8.3	-6.5	1033.0	-78.0
	P - 46	2/1/16	2/1/16	29	33	4	850.0	100.0	50.0	88.0	1.8	955.0	850.0	0.0	100.0	0.0	50.0	0.0	88.0	0.0	1.8	0.0	955.0	0.0
	P - 47	1/31/16	1/31/16	29	33	4	850.0	100.0	50.0	88.0	1.8	955.0	850.0	0.0	100.0	0.0	50.0	0.0	88.0	0.0	1.8	0.0	955.0	0.0
	P - 48	1/27/16	1/27/16	29	33	4	850.0	100.0	50.0	88.0	1.8	955.0	850.0	0.0	100.0	0.0	50.0	0.0	88.0	0.0	1.8	0.0	955.0	0.0
	P - 49	2/1/16	2/1/16	29	33	4	850.0	100.0	50.0	88.0	1.8	955.0	850.0	0.0	100.0	0.0	50.0	0.0	88.0	0.0	1.8	0.0	955.0	0.0
	P - 50	2/1/16	2/1/16	29	33	4	850.0	100.0	50.0	88.0	1.8	955.0	850.0	0.0	100.0	0.0	50.0	0.0	88.0	0.0	1.8	0.0	955.0	0.0
	P - 51	1/31/16	1/31/16	29	33	4	850.0	100.0	50.0	88.0	1.8	955.0	850.0	0.0	100.0	0.0	50.0	0.0	88.0	0.0	1.8	0.0	955.0	0.0
	P - 52	1/27/16	1/27/16	29	33	4	850.0	100.0	50.0	88.0	1.8	955.0	850.0	0.0	100.0	0.0	50.0	0.0	88.0	0.0	1.8	0.0	955.0	0.0
	P - 53	1/26/16	1/26/16	29	33	4	850.0	100.0	50.0	88.0	1.8	955.0	850.0	0.0	100.0	0.0	50.0	0.0	88.0	0.0	1.8	0.0	955.0	0.0
	P - 54	2/1/16	2/1/16	29	33	4	850.0	100.0	50.0	88.0	1.8	955.0	850.0	0.0	163.0	-63.0	115.0	-65.0	250.0	-162.0	8.3	-6.5	1033.0	-78.0
	P - 55	1/26/16	1/26/16	29	33	4	850.0	100.0	50.0	88.0	1.8	955.0	850.0	0.0	100.0	0.0	50.0	0.0	88.0	0.0	1.8	0.0	955.0	0.0
	P - 56	1/31/16	1/31/16	29	33	4	850.0	100.0	50.0	88.0	1.8	955.0	850.0	0.0	100.0	0.0	50.0	0.0	88.0	0.0	1.8	0.0	955.0	0.0
	P - 57	1/26/16	1/26/16	29	33	4	850.0	100.0	50.0	88.0	1.8	955.0	850.0	0.0	100.0	0.0	50.0	0.0	88.0	0.0	1.8	0.0	955.0	0.0
	P - 58	1/31/16	1/31/16	29	33	4	850.0	100.0	50.0	88.0	1.8	955.0	850.0	0.0	100.0	0.0	50.0	0.0	88.0	0.0	1.8	0.0	955.0	0.0
	P - 59	1/27/16	1/27/16	46	50	4	850.0	100.0	50.0	88.0	1.8	955.0	850.0	0.0	100.0	0.0	50.0	0.0	88.0	0.0	1.8	0.0	955.0	0.0
	P - 60	1/27/16	1/27/16	50	54	4	850.0	100.0	50.0	88.0	1.8	955.0	850.0	0.0	100.0	0.0	50.0	0.0	88.0	0.0	1.8	0.0	955.0	0.0
	Area Totals						27200.0	3200.0	1600.0	2816.0	57.6	30560.0	27200.0	0.0	3389.0	-189.0	1795.0	-195.0	3302.0	-486.0	77.2	-19.6	30794.0	-234.0

BOS 200 Injection Log

Project No.:	15250.02	Site:	Jones Road Superfund Site	AREA:	B
Page:	1				
Client:	EA - Engineering, Science, and Technology	Injected Product:	EHC - L, Dry Mix, KHCO3, DHC	Date(s):	1/26/2016
Address:	11600 Jones Road, Houston Texas	Injection Crew:	TJ Haley, Rich Freeman, David Fontana, Byron Pitulski	Drill Rig:	

Area B Point No.	Date (2015)	Start Time	End Time	Top Interval Depth (feet)	Bottom Interval Depth (feet)	Initial Press. (psi)	Flow Press. (psi)	Flow Rate (gpm)	Target Water (gal.)	Target EHC - L (gal.)	Target Dry Mix (lbs)	Target KHCO3 (lbs.)	Target DHC (lts)	Target Total Volume (gal.)	Injected Water (gal.)	Injected EHC - L (gal.)	InjectedDry Mix (lbs)	Injected KHCO3 (lbs.)	Injected DHC (lts)	Injected Total Volume (gal.)	Surfacing Yes or No	Notes/Comments:
55	1/26/16	9:30	11:30	29	33	65	55	5	850	100	50	88	1.8	955	596	70	35	62	1.26	670	No	
		11:30	12:18				70	7							254	30	15	26	0.54	285	No	Turned Flow up as per Client
	Point Totals								850	100	50	88	1.8	955	850	100	50	88	1.8	955		
63	1/26/16	9:40	11:30	50	54	65	55	5	850	100	50	88	1.8	955	561	66	33	58	1.19	630	No	
		11:30	12:24				65	7							289	34	17	30	0.61	325	No	Turned Flow up as per Client
	Point Totals								850	100	50	88	1.8	955	850	100	50	88	1.8	955		
53	1/26/16	10:40	11:30	29	33	65	50	5	850	100	50	88	1.8	955	267	31	16	28	0.57	300	No	
		11:30	13:12				55	6.5							583	69	34	60	1.23	655	No	Turned Flow up as per Client
	Point Totals								850	100	50	88	1.8	955	850	100	50	88	1.8	955		
61	1/26/16	11:00	11:30	50	54	70	55	5	850	100	50	88	1.8	955	134	16	8	14	0.28	150	No	
		11:30	13:37				60	6.5							716	84	42	74	1.52	805	No	Turned Flow up as per Client
	Point Totals								850	100	50	88	1.8	955	850	100	50	88	1.8	955		
57	1/26/16	14:36	17:16	29	33	70	60	7	850	100	50	88	1.8	955	850	100	50	88	1.80	955	No	
	Point Totals								#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!		
41	1/26/16	15:29	17:45	29	33	60	50	7	850	100	50	88	1.8	955	850	100	50	88	1.80	955	No	
	Point Totals								#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!		
39	1/26/16	15:45	18:17	29	33	85	80	5.5	850	100	50	88	1.8	955	850	100	50	88	1.80	955	No	
	Point Totals								850	100	50	88	1.8	955	850	100	50	88	1.8	955		
Page Totals															#REF!	#REF!	#REF!	#REF!	#REF!	#REF!		

BOS 200 Injection Log

Project No.: 15250.02 Site: Jones Road Superfund Site AREA: B Page: 1

Client: EA - Engineering, Science, and Technology Injected Product: EHC - L, Dry Mix, KHCO3, DHC Date(s): 1/27/2016

Address: 11600 Jones Road, Houston Texas Injection Crew: TJ Haley, Rich Freeman, David Fontana, Byron Pitulski Drill Rig:

Area B Point No.	Date (2015)	Start Time	End Time	Top Interval Depth (feet)	Bottom Interval Depth (feet)	Initial Press. (psi)	Flow Press. (psi)	Flow Rate (gpm)	Target Water (gal.)	Target EHC - L (gal.)	Target Dry Mix (lbs)	Target KHCO3 (lbs.)	Target DHC (lts)	Target Total Volume (gal.)	Injected Water (gal.)	Injected EHC - L (gal.)	InjectedDry Mix (lbs)	Injected KHCO3 (lbs.)	Injected DHC (lts)	Injected Total Volume (gal.)	Surfacing Yes or No	Notes/Comments:
60	1/27/16	9:30	11:47	50	54	85	80	7	850	100	50	88	1.8	955	850	100	50	88	1.80	955	No	
	Point Totals								850	100	50	88	1.8	955	850	100	50	88	1.8	955		
52	1/27/16	9:35	11:52	29	33	70	65	7	850	100	50	88	1.8	955	850	100	50	88	1.80	955	No	
	Point Totals								850	100	50	88	1.8	955	850	100	50	88	1.8	955		
33	1/27/16	10:10	12:15	28	32	70	60	7	850	100	50	88	1.8	955	850	100	50	88	1.80	955	No	
	Point Totals								850	100	50	88	1.8	955	850	100	50	88	1.8	955		
34	1/27/16	10:40	12:53	28	32	80	70	7	850	100	50	88	1.8	955	850	100	50	88	1.80	955	No	
	Point Totals								850	100	50	88	1.8	955	850	100	50	88	1.8	955		
59	1/27/16	13:53	16:15	46	50	90	80	7	850	100	50	88	1.8	955	850	100	50	88	1.80	955	No	Refusal at 50 feet, Instructed to Inject by client
	Point Totals								#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!		
31	1/27/16	14:50	17:06	28	32	65	60	7	850	100	50	88	1.8	955	850	100	50	88	1.80	955	No	
	Point Totals								#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!		
29	1/27/16	15:30	17:45	28	32	70	65	7	850	100	50	88	1.8	955	850	100	50	88	1.80	955	No	
	Point Totals								850	100	50	88	1.8	955	850	100	50	88	1.8	955		
Page Totals															#REF!	#REF!	#REF!	#REF!	#REF!	#REF!		

BOS 200 Injection Log

Project No.: 15250.02 Site: Jones Road Superfund Site AREA: A Page: 1

Client: EA - Engineering, Science, and Technology Injected Product: EHC - L, Dry Mix, KHCO3, DHC Date(s): 1/28/2016

Address: 11600 Jones Road, Houston Texas Injection Crew: TJ Haley, Rich Freeman, David Fontana, Byron Pitulski Drill Rig:

Area B Point No.	Date (2015)	Start Time	End Time	Top Interval Depth (feet)	Bottom Interval Depth (feet)	Initial Press. (psi)	Flow Press. (psi)	Flow Rate (gpm)	Target Water (gal.)	Target EHC - L (gal.)	Target Dry Mix (lbs)	Target KHCO3 (lbs.)	Target DHC (lts)	Target Total Volume (gal.)	Injected Water (gal.)	Injected EHC - L (gal.)	InjectedDry Mix (lbs)	Injected KHCO3 (lbs.)	Injected DHC (lts)	Injected Total Volume (gal.)	Surfacing Yes or No	Notes/Comments:
17	1/28/16	8:45	10:03	27	31	70	65	7	400	100	50	44	0.9	505	400	100	50	44	0.90	505	No	
	Point Totals								400	100	50	44	0.9	505	400	100	50	44	0.9	505		
14	1/28/16	8:45	9:59	27	31	100	95	7	400	100	50	44	0.9	505	400	100	50	44	0.90	505	No	
	Point Totals								400	100	50	44	0.9	505	400	100	50	44	0.9	505		
28	1/28/16	9:27	10:43	27	31	90	80	7	400	100	50	44	0.9	505	400	100	50	44	0.90	505	No	
	Point Totals								400	100	50	44	0.9	505	400	100	50	44	0.9	505		
23	1/28/16	9:36	10:03	27	31	80	70	7	400	100	50	44	0.9	505	156	39	20	17	0.35	197	Yes	Surfacing < 1 gallon out of MW - 1, 5 feet to the South
		10:03	11:13			70	65	5							244	61	30	27	0.55	308		
	Point Totals								400	100	50	44	0.9	505	400	100	50	44	0.9	505		
20	1/28/16	10:08	11:23	27	31	65	60	7	400	100	50	44	0.9	505	400	100	50	44	0.90	505	No	
	Point Totals								#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!		
18	1/28/16	12:40	13:52	27	31	80	75	7	400	100	50	44	0.9	505	400	100	50	44	0.90	505	No	
	Point Totals								#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!		
16	1/28/16	13:00	13:02	27	31	100	0	0	400	100	50	44	0.9	505	0	0	0	0	0.00	0	No	Max pressure achived, pulled rods tool did not open
		16:20	17:38	27	31	70	60	7							400	100	50	44	0.90	505	No	
	Point Totals								400	100	50	44	0.9	505	400	100	50	44	0.9	505		
25	1/28/16	13:41	14:50	27	31	70	65	7	400	100	50	44	0.9	505	400	100	50	44	0.90	505	No	
	Point Totals								400	100	50	44	0.9	505	400	100	50	44	0.9	505		
24	1/28/16	16:10	17:28	27	31	80	70	7	400	100	50	44	0.9	505	400	100	50	44	0.90	505	No	
	Point Totals								400	100	50	44	0.9	505	400	100	50	44	0.9	505		
Page Totals															#REF!	#REF!	#REF!	#REF!	#REF!	#REF!		

BOS 200 Injection Log

Project No.: 15250.02 Site: Jones Road Superfund Site AREA: A Page: 1

Client: EA - Engineering, Science, and Technology Injected Product: EHC - L, Dry Mix, KHCO3, DHC Date(s): 1/29/2016

Address: 11600 Jones Road, Houston Texas Injection Crew: TJ Haley, Rich Freeman, David Fontana, Byron Pitulski Drill Rig:

Area B Point No.	Date (2015)	Start Time	End Time	Top Interval Depth (feet)	Bottom Interval Depth (feet)	Initial Press. (psi)	Flow Press. (psi)	Flow Rate (gpm)	Target Water (gal.)	Target EHC - L (gal.)	Target Dry Mix (lbs)	Target KHCO3 (lbs.)	Target DHC (lts)	Target Total Volume (gal.)	Injected Water (gal.)	Injected EHC - L (gal.)	InjectedDry Mix (lbs)	Injected KHCO3 (lbs.)	Injected DHC (lts)	Injected Total Volume (gal.)	Surfacing Yes or No	Notes/Comments:
19	1/29/16	8:15	9:28	27	31	80	70	7	400	100	50	44	0.9	505	400	100	50	44	0.90	505	No	
	Point Totals								400	100	50	44	0.9	505	400	100	50	44	0.9	505		
9	1/29/16	8:20	9:31	28	32	70	65	7	400	100	50	44	0.9	505	400	100	50	44	0.90	505	No	
	Point Totals								400	100	50	44	0.9	505	400	100	50	44	0.9	505		
27	1/29/16	8:25	9:35	27	31	80	70	7	400	100	50	44	0.9	505	400	100	50	44	0.90	505	No	
	Point Totals								400	100	50	44	0.9	505	400	100	50	44	0.9	505		
6	1/29/16	8:30	8:33	28	32	80	70	7	400	100	50	44	0.9	505	16	4	2	2	0.04	20	Yes	Surfacing out of well < 1 gallon cut flow rate
		8:40	8:44				50	5							40	10	5	4	0.09	50	Yes	Still surfacing, stop injection, will add to Point 7
	Point Totals								400	100	50	44	0.9	505	55	14	7	6	0.12	70		
26	1/29/16	9:00	10:21	27	31	70	65	7	400	100	50	44	0.9	505	400	100	50	44	0.90	505	No	
	Point Totals								#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!		
5	1/29/16	13:13	14:25	28	32	85	80	7	400	100	50	44	0.9	505	400	100	50	44	0.90	505	No	
	Point Totals								#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!		
8	1/29/16	13:20	14:15	28	32	80	75	7	400	100	50	44	0.9	505	259	65	32	28	0.58	327	Yes	Surfacing out of IW -33, approx 3 feet North
		14:15	14:54				65	5							141	35	18	16	0.32	178		
	Point Totals								400	100	50	44	0.9	505	400	100	50	44	0.9	505		
3	1/29/16	13:50	15:07	28	32	75	70	7	400	100	50	44	0.9	505	400	100	50	44	0.90	505	No	
	Point Totals								400	100	50	44	0.9	505	400	100	50	44	0.9	505		
10	1/29/16	13:45	14:15	28	32	85	80	7	400	100	50	44	0.9	505	148	37	19	16	0.33	187	Yes	Surfaing out of IW -33, approx 3 feet South
		14:15	15:26				75	5							252	63	31	28	0.57	318		
	Point Totals								400	100	50	44	0.9	505	400	100	50	44	0.9	505		
Page Totals															#REF!	#REF!	#REF!	#REF!	#REF!	#REF!		

BOS 200 Injection Log

Project No.: 15250.02 Site: Jones Road Superfund Site AREA: A Page: 2

Client: EA - Engineering, Science, and Technology Injected Product: EHC - L, Dry Mix, KHCO3, DHC Date(s): 1/29/2016

Address: 11600 Jones Road, Houston Texas Injection Crew: TJ Haley, Rich Freeman, David Fontana, Byron Pitulski Drill Rig:

Area B Point No.	Date (2015)	Start Time	End Time	Top Interval Depth (feet)	Bottom Interval Depth (feet)	Initial Press. (psi)	Flow Press. (psi)	Flow Rate (gpm)	Target Water (gal.)	Target EHC - L (gal.)	Target Dry Mix (lbs)	Target KHCO3 (lbs.)	Target DHC (lts)	Target Total Volume (gal.)	Injected Water (gal.)	Injected EHC - L (gal.)	InjectedDry Mix (lbs)	Injected KHCO3 (lbs.)	Injected DHC (lts)	Injected Total Volume (gal.)	Surfacing Yes or No	Notes/Comments:
11	1/29/16	14:35	15:56	28	32	80	75	7	400	100	50	44	0.9	505	400	100	50	44	0.90	505	No	
	Point Totals								400	100	50	44	0.9	505	400	100	50	44	0.9	505		
1	1/29/16	15:18	16:35	28	32	75	70	7	400	100	50	44	0.9	505	400	100	50	44	0.90	505	No	
	Point Totals								400	100	50	44	0.9	505	400	100	50	44	0.9	505		
12	1/29/16	15:45	16:58	27	31	80	75	7	400	100	50	44	0.9	505	400	100	50	44	0.90	505	No	
	Point Totals								400	100	50	44	0.9	505	400	100	50	44	0.9	505		
4	1/29/16	16:05	17:17	28	32	85	80	7	400	100	50	44	0.9	505	400	100	50	44	0.90	505	No	
	Point Totals								400	100	50	44	0.9	505	400	100	50	44	0.9	505		
	Point Totals								#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!		
	Point Totals								#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!		
	Point Totals								0	0	0	0	0	0	0	0	0	0	0.0	0		
	Point Totals								0	0	0	0	0	0	0	0	0	0	0.0	0		
	Point Totals								0	0	0	0	0	0	0	0	0	0	0.0	0		
Page Totals															#REF!	#REF!	#REF!	#REF!	#REF!	#REF!		

BOS 200 Injection Log

Project No.: 15250.02 Site: Jones Road Superfund Site AREA: A / B Page: 1

Client: EA - Engineering, Science, and Technology Injected Product: EHC - L, Dry Mix, KHCO3, DHC Date(s): 1/30/2016

Address: 11600 Jones Road, Houston Texas Injection Crew: TJ Haley, Rich Freeman, David Fontana, Byron Pitulski Drill Rig:

Area Point No.	Date (2015)	Start Time	End Time	Top Interval Depth (feet)	Bottom Interval Depth (feet)	Initial Press. (psi)	Flow Press. (psi)	Flow Rate (gpm)	Target Water (gal.)	Target EHC - L (gal.)	Target Dry Mix (lbs)	Target KHCO3 (lbs.)	Target DHC (lts)	Target Total Volume (gal.)	Injected Water (gal.)	Injected EHC - L (gal.)	InjectedDry Mix (lbs)	Injected KHCO3 (lbs.)	Injected DHC (lts)	Injected Total Volume (gal.)	Surfacing Yes or No	Notes/Comments:
13	1/30/16	9:25	10:43	27	31	80	75	7	400	100	50	44	0.9	505	400	100	50	44	0.90	505	No	
	Point Totals								400	100	50	44	0.9	505	400	100	50	44	0.9	505		
21	1/30/16	9:22	10:35	27	31	100	95	7	400	100	50	44	0.9	505	400	100	50	44	0.90	505	No	
	Point Totals								400	100	50	44	0.9	505	400	100	50	44	0.9	505		
2	1/30/16	10:04	11:16	28	32	80	70	7	400	100	50	44	0.9	505	400	100	50	44	0.90	505	No	
	Point Totals								400	100	50	44	0.9	505	400	100	50	44	0.9	505		
22	1/30/16	10:06	11:18	27	31	75	70	7	400	100	50	44	0.9	505	400	100	50	44	0.90	505	No	
	Point Totals								400	100	50	44	0.9	505	400	100	50	44	0.9	505		
35	1/30/16	12:43	15:11	29	33	100	90	7	850	100	50	88	1.8	955	850	100	50	88	1.80	955	No	
	Point Totals								#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!		
32	1/30/16	13:15	15:42	28	32	90	80	7	850	100	50	88	1.8	955	850	100	50	88	1.80	955	No	
	Point Totals								#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!		
36	1/30/16	13:09	15:35	29	33	75	70	7	850	100	50	88	1.8	955	850	100	50	88	1.80	955	No	
	Point Totals								850	100	50	88	1.8	955	850	100	50	88	1.8	955		
	Point Totals								0	0	0	0	0	0	0	0	0	0	0.0	0		
	Point Totals								0	0	0	0	0	0	0	0	0	0	0.0	0		
Page Totals															#REF!	#REF!	#REF!	#REF!	#REF!	#REF!		

BOS 200 Injection Log

Project No.: 15250.02 Site: Jones Road Superfund Site AREA: B Page: 1

Client: EA - Engineering, Science, and Technology Injected Product: EHC - L, Dry Mix, KHCO3, DHC Date(s): 1/31/2016

Address: 11600 Jones Road, Houston Texas Injection Crew: TJ Haley, Rich Freeman, David Fontana, Byron Pitulski Drill Rig:

Area Point No.	Date (2015)	Start Time	End Time	Top Interval Depth (feet)	Bottom Interval Depth (feet)	Initial Press. (psi)	Flow Press. (psi)	Flow Rate (gpm)	Target Water (gal.)	Target EHC - L (gal.)	Target Dry Mix (lbs)	Target KHCO3 (lbs.)	Target DHC (lts)	Target Total Volume (gal.)	Injected Water (gal.)	Injected EHC - L (gal.)	InjectedDry Mix (lbs)	Injected KHCO3 (lbs.)	Injected DHC (lts)	Injected Total Volume (gal.)	Surfacing Yes or No	Notes/Comments:
62	1/31/16	7:57	10:22	50	54	80	70	7	850	100	50	88	1.8	955	850	100	50	88	1.80	955	No	
	Point Totals								850	100	50	88	1.8	955	850	100	50	88	1.8	955		
38	1/31/16	8:00	10:25	29	33	75	70	7	850	100	50	88	1.8	955	850	100	50	88	1.80	955	No	
	Point Totals								850	100	50	88	1.8	955	850	100	50	88	1.8	955		
56	1/31/16	8:30	10:53	29	33	80	70	7	850	100	50	88	1.8	955	850	100	50	88	1.80	955	No	
	Point Totals								850	100	50	88	1.8	955	850	100	50	88	1.8	955		
37	1/31/16	8:35	10:58	29	33	85	80	7	850	100	50	88	1.8	955	850	100	50	88	1.80	955	No	
	Point Totals								850	100	50	88	1.8	955	850	100	50	88	1.8	955		
58	1/31/16	11:45	14:06	29	33	80	75	7	850	100	50	88	1.8	955	850	100	50	88	1.80	955	No	
	Point Totals								#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!		
51	1/31/16	12:17	14:30	29	33	70	65	7	850	100	50	88	1.8	955	850	100	50	88	1.80	955	No	
	Point Totals								#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!		
42	1/31/16	12:15	14:28	29	33	70	65	7	850	100	50	88	1.8	955	850	100	50	88	1.80	955	No	
	Point Totals								850	100	50	88	1.8	955	850	100	50	88	1.8	955		
	Point Totals								0	0	0	0	0	0	0	0	0	0	0.0	0		
	Point Totals								0	0	0	0	0	0	0	0	0	0	0.0	0		
Page Totals															#REF!	#REF!	#REF!	#REF!	#REF!	#REF!		

BOS 200 Injection Log

Project No.: 15250.02 Site: Jones Road Superfund Site AREA: B Page: 1

Client: EA - Engineering, Science, and Technology Injected Product: EHC - L, Dry Mix, KHCO3, DHC Date(s): 2/1/2016

Address: 11600 Jones Road, Houston Texas Injection Crew: TJ Haley, Rich Freeman, David Fontana, Byron Pitulski Drill Rig:

Area Point No.	Date (2015)	Start Time	End Time	Top Interval Depth (feet)	Bottom Interval Depth (feet)	Initial Press. (psi)	Flow Press. (psi)	Flow Rate (gpm)	Target Water (gal.)	Target EHC - L (gal.)	Target Dry Mix (lbs)	Target KHCO3 (lbs.)	Target DHC (lts)	Target Total Volume (gal.)	Injected Water (gal.)	Injected EHC - L (gal.)	InjectedDry Mix (lbs)	Injected KHCO3 (lbs.)	Injected DHC (lts)	Injected Total Volume (gal.)	Surfacing Yes or No	Notes/Comments:
54	2/1/16	8:00	10:26	29	33	70	65	7	850	100	50	88	1.8	955	850	100	50	88	1.80	955	No	
	Point Totals								850	100	50	88	1.8	955	850	100	50	88	1.8	955		
40	2/1/16	8:05	10:31	29	33	75	70	7	850	100	50	88	1.8	955	850	100	50	88	1.80	955	No	
	Point Totals								850	100	50	88	1.8	955	850	100	50	88	1.8	955		
49	2/1/16	8:10	10:37	29	33	80	75	7	850	100	50	88	1.8	955	850	100	50	88	1.80	955	No	
	Point Totals								850	100	50	88	1.8	955	850	100	50	88	1.8	955		
46	2/1/16	8:15	10:42	29	33	75	70	7	850	100	50	88	1.8	955	850	100	50	88	1.80	955	No	
	Point Totals								850	100	50	88	1.8	955	850	100	50	88	1.8	955		
50	2/1/16	12:40	15:06	29	33	65	60	7	850	100	50	88	1.8	955	850	163	115	250	8.33	1033	No	Added extra materials as per client
		15:30	17:00	29	33	65	60	7												630		Tank and system rinse, used anaerobic water
	Point Totals								#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!		
44	2/1/16	12:50	15:16	29	33	75	70	7	850	100	50	88	1.8	955	850	163	115	250	8.33	1033	No	Added extra materials as per client
	Point Totals								#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	#REF!		
	Point Totals								0	0	0	0	0	0	0	0	0	0	0.0	0		
	Point Totals								0	0	0	0	0	0	0	0	0	0	0.0	0		
	Point Totals								0	0	0	0	0	0	0	0	0	0	0.0	0		
Page Totals															#REF!	#REF!	#REF!	#REF!	#REF!	#REF!		

Tank Number	Date	Time	Volume	Batch	Outside Temputure	DO mg/L	Comments
1	1/23/16	9:00	3400	B	39	0.38	Added 4 gallons EHC- L and 20 lbs Sodium Sulfite
2	1/23/16	9:20	3400	B	39	0.33	Added 4 gallons EHC- L and 20 lbs Sodium Sulfite
3	1/23/16	9:40	3400	B	39	0.28	Added 4 gallons EHC- L and 20 lbs Sodium Sulfite
1	1/23/16	15:00	3400	B	57	0.33	
2	1/23/16	15:25	3400	B	57	0.23	
3	1/23/16	15:45	3400	**B**	57	0.26	
1	1/24/16	10:45	3400	**B**	61	0.33	
2	1/24/16	11:00	3400	**B**	61	0.32	
3	1/24/16	11:30	3400	**B**	61	0.3	
3	1/25/16	15:00	3400	B	58	0.13	Added Entire Batch B Solution
3	1/26/16	8:00	3400	B	44	0.23	
3	1/26/16	14:45	3400	B	46	0.1	ORP -354, New B Batch
3	1/27/16		3400	B			
1	1/27/16		3400	B			
3	1/27/16	13:36	3400	B	52	0.2	ORP - 304
1	1/27/16	16:04	3200	A	51	0.22	
3	1/28/16	7:25	3200	A	39	0.23	ORP -344
1	1/28/16	7:40	3200	A	39	6.4	Added 20 lbs Sodium Sulfite
1	1/28/16	12:14	3200	A	59	0.33	
3	1/28/16	16:00	3200	A	66	0.24	ORP - 314
1	1/29/16	9:40	3200	A	54	0.25	
3	1/29/16	13:00	3200	A	72	0.28	ORP - 316
1	1/30/16	7:30	1600	A	55	0.39	
3	1/30/16	9:06	1600	A	59	0.22	ORP - 336
2	1/30/16	9:30	3400	B	59	0.21	
3	1/30/16	12:24	3400	B	71	0.22	ORP - 320
1	1/30/16	15:00	3400	B	75	0.23	
3	1/31/16	7:32	3400	B	63	0.1	ORP - 392
2	1/31/16	8:00	3400	B	63	0.34	
3	1/31/16	11:40	3400	B	72	0.24	
1	1/31/16	13:00	3400	B	75	0.37	

ATTACHMENT E

FIELD NOTES

Location Harris Co, TX Date 01/21/16

Project / Client Rooney Rd, EPA Region VI

Site walk / Pre-launch injection meetings

0935 Depart for site
WEATHER: Mostly cloudy and becoming windy with thunderstorms likely in afternoon High 69°F. Winds 20-30 mph. Chance of rain 100%
PLAN FOR THE DAY: Site walk with EPA/TCEQ et all, injection prewalk
0938 Arrive on site
TCEQ: Marilyn Long
EPA: Camile
SEKO:
EA Duane Thomas, Pat Appel
0940 Meet with SEKO staff for 5 year review site walk
1000-1400 Site Walk
1405 Meet with property manager Jesse to go over injection activities scheduled to begin next day
1500 Meeting concluded
1555 Depart site to pick up pallet jack for drum unloading in am.

Location Harris Co, TX Date 01/22/16

Project / Client Jones Rd, EPA Region VI

~~Site walk~~ Mobilization for injection activities

0630 Depart for office
WEATHER: Mostly Cloudy early, then sunshine for the afternoon. High 53°F. Winds NNW at 15-25 mph.
0700 Depart for site
0705 Safety Meeting
* Truck with injection drums on site.
PLAN FOR THE DAY: Begin mobilizing equipment and materials
* Bill of lading has no bacteria for morning
- Bill of lading also has a liftgate truck being sent by Quality Transport with a lift gate. The truck had neither. The charge rate will be checked.
0745 Unloading of drums begins
- Security fence in place
* Photo: unloading and fencing for Hailey
* OHC + K bicarbonate not on Friday delivery. Will confirm with Proxy
0900 Confirm with Proxy chem that 2nd delivery will take place Monday morning 8am
1030 A gray Mitsubishi SUV is in fenced area. Tags are long expired. EA had mentioned SUV to property management. Vista and EA

Location Harris Co, TX Date 01/22/16

Project / Client Jones Rd GW Plume EPA 6

Mobilization

SUV will remain in fenced in process area. Both EA + Vista documented vehicle with photos

1218 2nd Rain for Rent tank onsite

- 3rd party locator continues to mark on property lines

1333 Vista preparing to begin pumping + filling water tanks

1420 Receive call from UPS. Holding DHC at main facility. Will go pick up DHC.

1526 Return to site with DHC,

* DO reading for mixing tank is 7.06 mg/L

- more sodium bicarbonate added

1526 - 1800 Stage equipment, condition mixing tanks water

1805 Depart Site

Location Harris Co, TX Date 01/23/16

Project / Client Jones Rd GW Plume, EPA 6

Mobilization

0700 Depart for Office

WEATHER: Sunny, high 57°F winds light and variable

PLAN FOR THE DAY: Continue staging equipment. Continue to condition water to make it anerobic

0730 Safety Meeting

0850 DO check on 3 tanks has dropped

Mix tank 1: 0.30

Mix tank 2: .33

Batch tank: 0.28 (tank 3)

* Photo: Plumbing prep of tanks

1120 Supplies shipper bringing replacement ball valve for pumping trailer will not be on site until 1400

1140 Photo: Staged drums behind shopping center

1430 Drums staged behind building where property manager suggested

1430 - ~~1530~~ Set up completed for the day

1530 Depart Site

Location Harris Co, TX Date 01/25/16

Project / Client Jones Rd GW Plume, EPA Region 6

Mixing / Injection

0630 Depart for site
0700 Arrive on site
WEATHER: Mix of clouds and sun in morning followed by mostly cloudy skies & a few showers in afternoon. High near 75°F. Winds S-SSW at 10-15 mph. Chance of rain 50%
0715 Safety Meeting
PLAN FOR THE DAY: Begin mixing injectable batch of injectate. Possibly begin injections
0730 EA Jay S onsite
0815 Begin moving EHC to batch tank
0842 EHC difficult to move through bladder pump due to viscosity. Vista cutting the drums with ~2 gal water to move - pumping still slow
0935 Pump augmented to use both bladder pump and trash pump
0935 Trouble shooting mixing system
1120 Depart Site to pick up YSI for ORP readings
1228 Return to site. Mixing set up continuing - system is mixing. Vista getting system optimized
1530 Mixing continued

Location Harris Co, TX Date 01/25/16

Project / Client Jones Rd GW

Mixing / Injection

DO meter : 0.20 → 0.13
YSI DO : 1.23 mg/l 0.50
ORP : -360 -307
Batch 1 : 8 drums EHL
8 Bags ~~KHCO3~~ EHC Dry
7.5 Bags $KHCO_3$
20 ~~Bags~~ Pounds Sodium Sulfite per tank
3400 gal water
1530-1800 Continue injection prep
1800 Depart Site

Location Harris Co, TX Date 01/26/15

Project / Client Jones Rd GW Plume, EPA 6

GW Injection

0630 Depart for Site

0700 Arrive onsite

WEATHER: Overcast with rain showers. High near 55°. Winds NNE at 10-20mph. Chance of rain 60%.

0730 Safety Meeting

PLAN FOR THE DAY: Begin injection of B concentration points

Will check mix DO & ORP one last time before injecting

Proposed Points (B conc.) 55 + 58 (shallow)
61, 63 (deep + shallow)

0735 Begin driving point 55

* Photo: driving rods at point 55

Pre Injection Chemistry: DO: 0.27 mg/l
ORP: -327

0849 Begin adding DHC to injectate 7.2L

* Photo: Adding DHC to mix

0916 Point 55 injection started

0926 - 5.05 gal min needed point 55 at 50psi

0926 Point 63 started

- 5.50 gpm at 52psi

0931 Vista will start driving rods at point ~~61~~ 53 (deep)

Location Harris Co, TX Date 01/26/15

Project / Client Jones Rd GW Plume EPA 6

GW Injection

MW-6 :	DTW	36.23	1105	1109	1153
	TD	35.00			
MW-22 :	DTW	47.98	47.84	47.60	46.66
	TD				

1000 Begin driving rods at 53 & 61

1025 Rig on #61 has to shift hole. Rod was pulled off plumb by subsurface object

1030 Point #53 injection started

Donald Haws

11627 Echo Spring

832-647-5214 no message deep

1130 Vista will begin testing at higher pressure and gpm

- will run at 26 psi which will pump injectate at 6.5 - 7.0 gpm to sample points

1153 DTW MW-22 46.50

1212 Point 55 finished 955.13 total gal

1218 Point 63 finished 955.14 total gal

1233 Begin setup for batch #2

* Photo: Setting up batch #2

1312 Point 53 Complete 955.08 total gal

1332 MW-06 DTW 30.95

≈ 1.4 foot rise in MW-06 over 4hrs

Location Harris Co, TX Date 01/24/18

Project / Client Jones Rd GW Plume, EPA Region 6

GW Injections

Batch 2 Constituents
- 8 Drums ELS
- 8 Bags Dry Mix
- 7.5 Bags Potassium ($KHCO_3$)
- 7.2 liters DHC

1337 Point 61 complete 955.0 gallons
1350 Take WQ readings of batch tank
DO: 0.10 mg/L YSI: 1.71
ORP: -353
1406 Begin driving rods for Point 57
1431 Begin driving rods for point 43
+ Photo: Driving point 43
1456 Begin injection on ~~43~~ 57
1500 Begin injection on 43
1503 Begin driving on pt. 41
1505 Begin driving on pt. 39
1521 Begin injecting pt 41
1515 Begin injection pt 39
1716 Point 57 done at 955 gal
1722 Point 43 done at 955 gal
1725 Vista begins pulling pts 57 & 43
1730 Vista will begin batch #3 prep in advance of tomorrow's injections
1745 Point 41 complete · 955 gal

Location Harris Co. TX Date 01/24/18

Project / Client Jones Rd GW Plume, EPA 6

GW Injections

1817 Point 39 Complete 955.0 gal
1830 Batch #3 No Change (B conc.)
- 8 drums EHC
- 8 bags dry mix
- 7.5 bags $KHCO_3$

* DHC will not be added until morning
1900 Depart Site

Location Harris Co, TX Date 01/27/16

Project / Client Jones Rd GW Plume EPA 6

GW Injections

0630 Depart for site
0700 Arrive on site
WEATHER: Some clouds this evening will give way to clear skies overnight. Low 33°F Winds light and variable
0730 Safety Meeting
PLAN FOR THE DAY: Continue ~~[illegible]~~ injections
0715 Set up for driving rods at point 60, 52
Batch:
ORP -291
DO 0.23mg/L
*Photo: Driving point 60
* Utility crew is running horizontal drill for utility install. Equipment covering some points
- spoke to foreman & work should on take 2 hours
0802 Begin pumping 60, 52
MW-22:
DTW 47.60
MW-06: 31.65
0830 Generator has quit, begin repairs
*Photo: plugging borings
0923 Point 60 restarted
- Points 33, 34 will be started next

Location Harris Co, TX Date 01/27/16

Project / Client Jones Rd GW Plume, EPA 6

GW Injection

1000 Point 33 started
- Aerial Video + Pics taken
1026 Point 34 started
1047 Additional line backers / hose protectors delivered to site
*Photo Vesta cleaning drums for disposal
1147 Point 60 completed 955 gal
1148 Point 52 completed 955 gal
1200 Begin prep on Batch #4 (B: conc)
- Point 59 will be next
1217 Begin driving point 59
*Photo: driving point 59
1220 Will begin driving point 48
1253 Point 34 completed 955 gal
1255 Begin driving point 48
1305 Driving at point 59 will not extend past 50'. Injection zone is
- 46 - 50' bgs
- Injection at 59 proceeding with no issues
*Photo Injection of point 48
1415 7822DT Geoprobe Broken Down
1445 Start injection on point 31
1455 Begin driving point 29
1526 Begin injection on pt 29

Location Harris Co, TX Date 01/27/16

Project / Client Jones Rd GW Plume, EPA Region VI

GW Injections

* Photo: Vista repairing borehole with concrete

1601 Vista pre-conditioning water in tank 1 for A concentration injections taking place tomorrow

- DO .22 Tank 1
- Tank 2 contains pre-conditioned water for B concentration

* No Change in Batch 4 (B conc.) than previous mixes

1622 Pt 48 complete 955 gal

- 1615 for pilot point 59 955 gal

* 7822D Geoprobe still down

1642 7822D repaired/running

1658 Beginning Batch 5 (A conc.) mixing 16 Drums EHC, 7 Bags $KHCO_3$, 400lb dry mix, 3200 gal H_2O

1706 Point 31 Completed 955 gal

1745 Point 29 completed 955 gal

1745-1830 Clean up & mix/circulate batch

1835 Depart Site

Location Harris Co, TX Date 01/28/16

Project / Client Jones Rd GW Plume, EPA Reg. 6

GW Injections

0630 Depart for Site

0700 Arrive on site

WEATHER: Sunny, high 68°F. Winds W at 5-10 mph

0715 Safety Meeting

PLAN FOR THE DAY: Continue injections at A concentration points

Rigs set up on A points 14 and 17

Batch 5:

DO: 0.23 mg/l

ORP: -344

* Photo: setup on 14 & 17

0851 14 & 17 both injecting

* Photo: Driving pt 28

* Photo: Spill kit for possible daylighting

* Owner of Mekong Restaurant complained about blocking off his parking spaces. We agreed to shift the next 2 driving locations for 1 rig to his spaces so we can remove the exclusion zone from the front of his store

0924 Begin injecting point 28

* Points are taking fluid well. 7-8 gpm at 40-60 psi. Vista will drive additional rods at pts 15 and 21 to speed operation

Location Harris Co, TX Date 01/28/16

Project / Client Jones Rd GW Plume

GW Injections

0959 Daylighting out of MW-01
-will reduce pressure
1009 Start injection at Pt 15
0959 Point 14 completed 450 gal
1003 Point 17 completed 450 gal
1008 Point 20 injection started
1023 POINT 23 injection completed
1130 Property manager Jesse is upset about store front injection locations. He said we are taking up too much space. I explained to him we are trying to clear storefront locations as quickly as possible with priority. We aim to have all store front injection points done by end of day.
1200 Mekong Storefront clear of equipment.
*Photo: Mekong storefront cleared
1223 Point 18 being hooked up to injection trailer
* Point 16 being pushed.
- both rigs functional. Both still need minor repairs.
* Point 24 will be moved 3 feet west to avoid proximity to CMT-01
1223 Point 18 injection started

Location Harris Co. TX Date 01/28/16

Project / Client Jones Rd GW Plume

GW Injections

1302 Point 16 not taking fluid
1310 Begin driving point 25
*Point 16 will be removed and re-driven
*Photo: Driving and removing points 16 + 25
1339 Begin injecting point 25
1420 Upstream begins A concentration mix
1450 Point 25 Completed
- Point 23 completed, Point 18 completed
1515 Set up on ~~MW~~ point 24
1548 Batch #6 Completed
DO: 5.26 mg/l
ORP: -318
*Injections will continue on #16 (re-pushed) and begin on #24
1600 Daylighting near point 19. Likely from a hose and not liquid from the ground.
* Photo: Liquid on ground near pt 19
1615 Begin injections at 16 & 24
1730 Point 24 Completed 450 gal
1734 Point 16 Completed
1734 - 1840 Cleanup
1850 Depart Site - 10 A points completed

Location Harris Co TX Date 01/29/16
Project / Client Jones Rd EPA Region 6
GW Injections

0630 Report for site
0700 Arrive on site
WEATHER: Sunny, high 76°F. Winds SSW at 10-15 mph
0715 Safety Meeting
PLAN FOR THE DAY: Continue "A" concentration injections
0720 Continue laying out linebackers across lot towards building
- Points 6, 27, 19 driven
*Photo: setting up linebackers
*Photo: Driving point 6
- Batch 6 being recirculated
0740 Begin driving point 9
0819 Point 19 injection started
0821 Point 09 injection started
0840 Daylighting at MW-02 Coming from ground surrounding pad and grout seal around well
-will have to try a low pressure or move away from MW-02
*Photo: Daylighting from MW-02
* EA will combine points 6+7 due to utilities restricting movement of 6. Point 7 will have to be moved due to

Location Harris Co, TX Date 01/29/16
Project / Client Jones Rd GW Plume, EPA 6
GW Injections

utilities anyway. The new point for both 6@7 will be approximately 1/2 distance between the 2 points. The combined point 6+7 will recieve double volume or 1010 gallons
* Photo: location 7 in utility cluster
0925 Pumping on 26, 19, 27 and 9
*Photo: Point 6+7 new location
Injections Completed
0928 19 injection completed
0931 9 ↓
0935 27 injection completed
* Tank 1 conditioned
0951 Point 6+7 (1010 gal) started
no daylighting from MW-02 as of yet
1026 Point 26 completed
* Rig will be moved behind building for points 01-05
*Photo: Rig setting up on pt 5
1037 Rig setting up on point 13
1115 Begin mixing batch #7 (A conc)
*Photo: Cleaning drums for disposal
Point 6: 70 gal prior to daylighting
Point 6+7 940 gallons

Location: Harris Co, TX Date: 01/28/16
Project / Client: Jones Rd GW Plume EPA6
GW Injection

Point 6+7 finished at 1215
- Points 05 + [illegible] driven ready for injection
Batch 7 ORP + DO readings:
12:88 ORP: -316
DO: 0.28
13:12 - Point 05 - injection - Begin - 80 psi / 7 gallons per minute (gpm)
13:15 - ~~03~~ driving point 03 / Completed @13:55
13:15 - driving point 08
point 08 completed @ 13:32
13:33 - Begin driving point 10
13:58 - complete driving point 10
13:59 - Begin injection of point 03
14:07 Begin driving point 11
14:[illegible] - Complete driving point 11
14:10 - Begin driving point 01
14:11 - Begin injection of point 10: 7 gpm / 60 psi
14:11 - Begin injection of point 08 / 60 psi
* Some daylight @ IW 3 (photo)
14:25 Injection of port 05 completed

Location: Harris Co., TX Date: 01/29/2016
Project / Client: Jones Rd GW Plume
GW Injection

14:30 - Begin injection of point 11 60 psi
15:00 - Injection of point 08 completed
15:10 - point 01 - boring completed
15:15 - Begin Injection - Point 01
15:16 - Begin driving point 12
15:23 - Injection of point 01 - 60 psi
15:30 - Injection of point 03 completed
15:35 - Complete driving point 12
15:40 - Begin driving point 04
15:41 - Begin injection of point 12
15:42 - Complete injection of point 10
1640 Begin prep for batch 8
- will be mixed in morning
- prep water will not meet 24 hour prep time
- mix will be final A conc. batch for 4 holes
1705 Begin pulling Point 12
*Photo: pulling point 12
1720 Complete Point 03 injection

Location Harris Co, TX Date 01/29/16

Project / Client Jones Rd GW Plume, EPA 6

GW Injections

1725 Begin cleanup

- 14 total A concentration holes completed

1830 Depart Site

Location Harris Co, TX Date 01/30/16

Project / Client Jones Rd GW Plume EPA 6

GW Injections

0630 Depart for Site

0700 Arrive on site

WEATHER: Fog early, becoming mostly sunny this afternoon high 77°F. Winds SSW at 10-20 mph

PLAN FOR THE DAY: Continue + complete A concentration locations, continue & resume B concentration locations

0710 Safety Meeting

0720 Begin driving locations

& begin driving linebreakers

* Will mix 48 locations north of A concentration to complete A points

Batch 8

- 8 drums EHC
- 8 bags dry mix 3.6 L DHC
- 4 bags $KHCO_3$
- 1600 gal water

*Photo: Setting up safety devices for lot and driving location 13

*4 A locations Remaining 2, 13, 21 & 22

Batch 8 Readings

DO: 0.22 mg/L

ORP: -338

Location Harris Co, TX Date 01/30/16

Project / Client Jones Rd GW Plume

GW Injections

0924 Begin injection at point 21
0930 Begin moving rig behind the building to point 02
0936 Point 36 not accepting Fluid - leaking from ~~may~~ hose connection
- may be subsurface or hose
- hose connection bus
0938 Begin injection at point 13
0942 Begin driving point 2
* Photo: driving point 2
1006 Begin injection at Point 22
* Photo: ~~Driving~~ Injecting point 22
1013 Point 13 completed
1035 Point 21 completed
1116 Point 2 completed
1118 Point 22 completed
- Begin mixing B batch
* All A points COMPLETE
* Next points to be injected are 30, 32, 35, 36 (B Conc.)
1200 Begin set up & driving points
* Photo: Setup for Drug & injections 30, 32 35, 36
Batch #9 (B conc)
DO: 0.22 mg/l ORP -320

Location Harris Co, TX Date 01/30/16

Project / Client Jones Rd GW Plume

GW Injections

1235 Start injection 35
1248 Start injection 30
1312 Start injection at 36
1318 Start injection at point 32
1510 Point 35 complete 955 gal
* Vista will not attempt a 3rd batch injection today. Vista will prep batch 10 & mix tonight
1512 Point 30 Complete
1542 Point 32 injection complete
1546 Point 36 injection complete
* Photo: Vista plugging point 35 with hole plug
1600 Begin mixing batch #10. (B conc)
- 8 drums EHC
- 8 bags dry mix
- 7.5 bags $KHCO_3$
- 3400 gal water
- 7.2 liters DHC
1600 - 1800 Cleanup for the day
1840 - Depart Site

Location Harris Co, TX Date 01/31/16

Project / Client Jones Rd GW Plume

GW Injections

0630 Depart for site
0700 Arrive on site
WEATHER: Clouds in the morning. Some decrease in clouds later in the day. High near 80°F. Winds SSW at 10-20 mph.
0715 Safety Meeting
PLAN FOR THE DAY: Continue B concentration injections
0720 Begin pushing rods at 62, (deep), 38 37 and 56
- 2nd 42, 47, 58 + 51 2nd batch
Begin injections
0754 Begin injections at 62 at
* Rear gate is not open. Will call Jessie to get lock combination. No shops are open Sunday it appears
0800 Left message with property owner/manager Jessie. If we do not hear a response we will cut + replace the locks
0958 Begin staging for batch 11.
1018 Point 38 complete
1025 Point 37 complete
* Photo: Pulling rods from points 37 + 58
1110 Points 56, 62 complete begin pulling

Location Harris Co, TX Date 01/31/16

Project / Client Jones Rd GW Plume

GW Injections

* Photo: Mixing $KHCO_3$ into batch 11
1117 Vista begins driving rods at point 47
Batch 11 mix unchanged
- DO 0.24 mg/l
- ORP -320
* Photo: Working area 42, 47, 58 51
1337 Begin mixing batch 12
1406 Point 47 completed
1427 Point 51 completed
1448 Point 42 being pulled
1500 Point 58 being pulled
1530 - 1730 Cleanup
1745 - Depart site

Location Harris Co, TX Date 02/01/16

Project / Client Jones Rd GW Plume

GW Injections

0630 Depart for site

0700 Arrive on site

WEATHER: Areas of dense fog in a.m. Cloudy skies this morning will become partly cloudy this afternoon. High 78°F. Winds SSE at 15-25 mph

0715 Safety Meeting

PLAN FOR THE DAY: Complete 7 final injection locations

0716 Begin driving rods at locations 40, 46, 49 and 50.

*Photos: driving point 46

*Photo: driving point 54

Batch 12 Parameters

DO: 0.17 mg/l

ORP: 0-122

*No change in batch ingredients

*Photo: adding DHC to mix

0858 All 4 points 40, 46, 49, 54 being injected

*Photo: Setup on 40, 46

0911 Vista starting preliminary demobing activities, preparing for injection completion

0942 Staging final batch

- extra DHC (4 drums) will be mixed in to final batch

Location Harris Co, TX Date 02/01/16

Project / Client Jones Rd GW Plume

GW Injections

1040 Points 40, 46, 49, 50 injection complete

Batch 13

10 Drums EHC

13 Bags Dry Mix

15 Bags $KHCO_3$

25L DHL

2515 gal H_2O (anaerobic)

1044 Begin mixing Batch 13

1046 Begin pulling rods at points 40, 46, 49, 50

- Will begin driving remaining points 44, 45 and 50

1105 Injection Mixed

DO: 0.24 mg/L

ORP: -216

1108 Vista begins cleaning/washing water holding tanks

*Photo: cleaning tanks.

* Wash water being used is anaerobic water from tank 2. All wash water will be injected into last point

*Photo: pressure washing staging area.

Location Harris Co, TX Date 02/01/16

Project / Client Jones Rd GW Plume, EPA6

GW Injections

1558 De-Mob prep & tank wash continuing

1729 Tanks washed, trailer cleaning continuing

1530 Begin pulling rods from points 50, 44 45

* Photo: pulling rods at point 50

1570 - 1830 Pull rods, clean equipment/de-mob prep

1835 Depart Site

Location Harris Co, TX Date 02/02/16

Project / Client Jones Rd GW Plume, EPA6

GW Injections

0630 Depart for site

0700 Arrive on site

WEATHER: Partly Cloudy Skies, High 74°F Winds WNW at 10-15 mph

0715 Safety Meeting

PLAN FOR THE DAY: Continue de-mob from site

0720 Begin staging Geoprobes for de-mob

* Photo: staging Geoprobes

* Photo: All drums removed & used from behind building

0930 Rain for rent picks up batch tank

1247 Transporter on site to load materials

* Photo: loading Geoprobe

* Vista will take the majority of the drums

- Vista cannot use pallets

- will stack near drums behind building

1443 Rain For Rent returns for tank #2

1456 2nd Rain for rent truck returns for tank 1

* Photo: loading tank 1

* Photo: power washing staging area

1615 Continue power washing lot

* Photo: powerwashing lot

Location Harris Co, TX Date 02/02/16

Project / Client Jones Rd GW Plume

De-Mob

1500-1800 Complete de-mob, fencing, fork lift and portolet will be picked up 02/03

1805 Depart site

Location Date

Project / Client

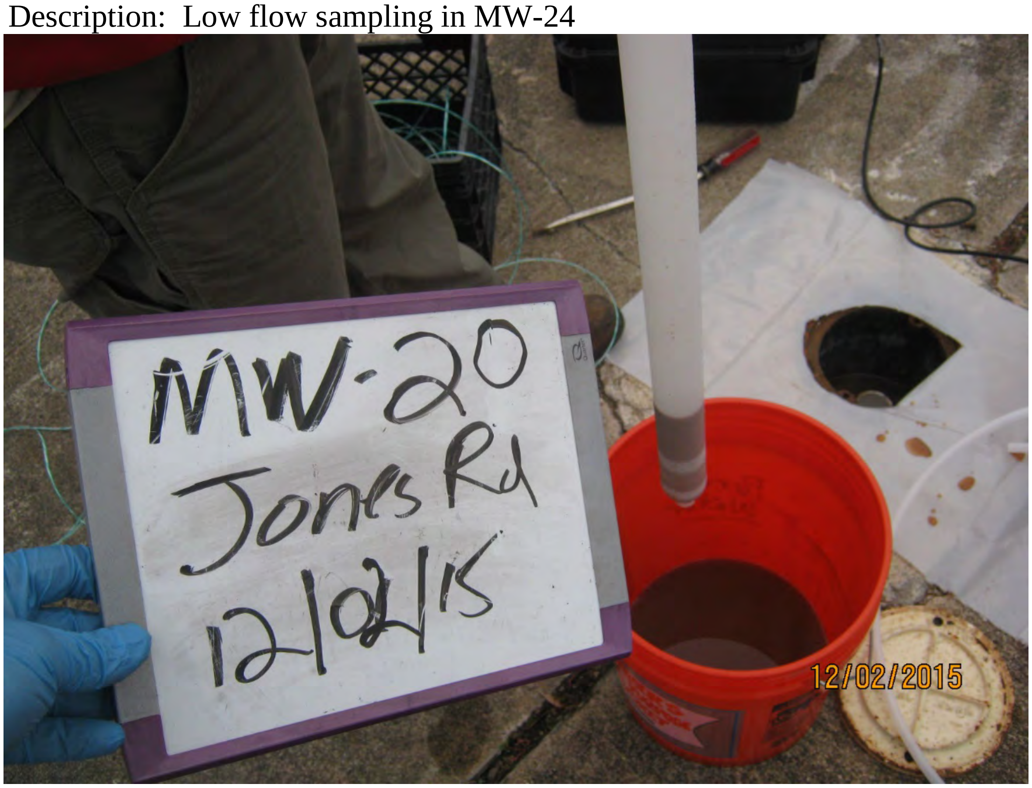
APPENDIX F

PHOTOGRAPHIC DOCUMENTATION

Photograph No. 1 (30 November 2015)
Description: Purging MW-06

Photograph No. 2 (30 November 2015)
Description: Preparing to do low-flow sampling in MW-22

Photograph No.3 (1 December 2015)
Description: Low flow sampling in MW-24



Photograph No. 4 (2 December 2015)
Description: Water purge from MW-20

Photograph No. 5 (3 December 2015)
Description: Low flow purging and sampling MW-02

Photograph No. 1 (25 January 2016)
Description: EHC pre-mix

Photograph No. 2 (25 January 2016)
Description: Injection Tool

Photograph No.3 (25 January 2016)
Description: Nitrogen Tank and DHC Injection Set Up

Photograph No. 4 (26 January 2016)
Description: Driving Injection Rods at Point 63

Photograph No. 5 (26 January 2016)
Description: Connecting

Photograph No. 6 (26 January 2016)
Description: Pumping EHC

Photograph No. 7 (26 January 2016)
Description: Checking DO and ORP levels prior to injection.

Photograph No. 8 (27 January 2016)
Description: Injection rod during injection.

Photograph No. 9 (29 January 2016)
Description: Concrete repair bore hole

Photograph No. 10 (29 January 2016)
Description: Daylighting from IW-3

Photograph No. 11 (30 January 2016)
Description: Setting up safety devices.

Photograph No. 12 (1 February 2016)
Description: Staging drums for removal.

Photograph No. 1 (18 April 2016)
Description: MW-02

Photograph No. 2 (18 April 2016)
Description: MW-03

Photograph No.3 (18 April 2016)
Description: MW-08 hidden under 8 inches of soil

Photograph No. 4 (18 April 2016)
Description: MW-20

Photograph No. 1(22 September 2016)
Description: MW-20

Photograph No. 2 (22 September 2016)
Description: MW-09

Photograph No. 1 (23 February 2017)
Description: Purging MW-01

Photograph No. 2 (22 February 2017)
Description: Preparing to gauge MW-03

Photograph No.3 (21 February 2017)
Description: Setting up on MW-08 for low flow

Photograph No. 4 (21 February 2017)
Description: Location MW-20

Photograph No. 1 (13 September 2017)
Description: Location MW-08

Photograph No. 2 (13 September 2017)
Description: Location MW-20

Photograph No. 1 (27 March 2018)
Description: EHC pre-mix

Photograph No. 2 (27 March 2018)
Description: EHC mixing area

Photograph No. 3 (27 March 2018)
Description: Injection Point

Photograph No. 4 (28 March 2018)
Description: EHC staging area

Photograph No. 5 (28 March 2018)
Description: Injection point plugging

APPENDIX G

STATE OF TEXAS INJECTION WELL REPORTS

STATE OF TEXAS PLUGGING REPORT for Tracking #185546

Owner:	**US EPA Region 6**	Owner Well #:	**P1 - P63**
Address:	**1445 Ross Ave Suite 1200 Dallas, TX 75202**	Grid #: Latitude:	**65-04-4** **29° 56' 32.38" N**
Well Location:	**11600 Jones Rd Houston, TX 77070**	Longitude:	**095° 35' 04.6" W**
	Multiple boring locations throughout the shopping center parking lot. 63 locations 10 foot on center varying in depth of 33 - 54 feet bgs. Injection of emulsified vegetable oil into each location for groundwater remediation purposes.	Elevation:	**No Data**
Well County:	**Harris**		

Well Type: **Environmental Soil Boring** Number of Wells Plugged: **63**

Drilling Information

Company: **Vista GeoScience** Date Drilled: **2/3/2016**

Driller: **Mike W Martin** License Number: **59374**

Well Report Tracking #430595

	Diameter (in.)	*Top Depth (ft.)*	*Bottom Depth (ft.)*
Borehole:	**1.5**	**0**	**54**

Plugging Information

Date Plugged: **3/28/2018** Plugger: **Brad Orban**

Plug Method: **Tremmie pipe cement from bottom to top**

Casing Left in Well: **No Data**

Plug(s) Placed in Well:

Top (ft.)	*Bottom (ft.)*	*Description (number of sacks & material)*
0	**54**	**Cement 10 Bags/Sacks**

Certification Data: The driller certified that the driller plugged this well (or the well was plugged under the driller's direct supervision) and that each and all of the statements herein are true and correct. The driller understood that failure to complete the required items will result in the reports(s) being returned for completion and resubmittal.

Company Information:	**Vista Geoscience** **111 Postoak Dr.** **Whitney, TX 76692**		
Driller Name:	**Brad Orban**	License Number:	**55014**
Comments:	**No Data**		

STATE OF TEXAS WELL REPORT for Tracking #430595

Owner: **US EPA Region 6**

Address: **1445 Ross Ave**
Suite 1200
Dallas, TX 75202

Well Location: **11600 Jones Rd**
Houston, TX 77070

Multiple boring locations throughout the shopping center parking lot. 63 locations 10 foot on center varying in depth of 33 - 54 feet bgs. Injection of emulsified vegetable oil into each location for groundwater remediation purposes.

Well County: **Harris**

Number of Wells Drilled: **63**

Owner Well #: **P1 - P63**

Grid #: **65-04-4**

Latitude: **29° 56' 32.38" N**

Longitude: **095° 35' 04.6" W**

Elevation: **No Data**

Type of Work: **Groundwater Remediation Borings**

Proposed Use: **Environmental Soil Boring**

Drilling Start Date: **1/22/2016** Drilling End Date: **2/3/2016**

	Diameter (in.)	*Top Depth (ft.)*	*Bottom Depth (ft.)*
Borehole:	**1.5**	**0**	**54**

Drilling Method: **Direct Push**

Borehole Completion: **Plugged**

Annular Seal Data: **No Data**

Seal Method: **Tremie**

Sealed By: **Driller**

Distance to Property Line (ft.): **No Data**

Distance to Septic Field or other concentrated contamination (ft.): **No Data**

Distance to Septic Tank (ft.): **No Data**

Method of Verification: **No Data**

Surface Completion: **Patched to match existing surface - asphalt or con** **Surface Completion by Driller**

Water Level: **No Data**

Packers: **No Data**

Type of Pump: **No Data**

Well Tests: **No Test Data Specified**

Plug Information:

Description (number of sacks & material)	*Top Depth (ft.)*	*Bottom Depth (ft.)*
Bentonite	**1**	**54**

Water Quality:

Strata Depth (ft.)	*Water Type*
No Data	**No Data**

Chemical Analysis Made: **No**

Did the driller knowingly penetrate any strata which contained injurious constituents?: **Yes**

Top Depth (ft.)	*Bottom Depth (ft.)*	*Natural Injurious Constituents*	*Unnatural Injurious Constituents*
33	**54**		**Hazardous Waste Contamination**

The driller did certify that while drilling, deepening or otherwise altering the above described well, injurious water or constituents was encountered and the landowner or person having the well drilled was informed that such well must be completed or plugged in such a manner as to avoid injury or pollution.

Certification Data: The driller certified that the driller drilled this well (or the well was drilled under the driller's direct supervision) and that each and all of the statements herein are true and correct. The driller understood that failure to complete the required items will result in the report(s) being returned for completion and resubmittal.

Company Information: **Vista GeoScience**

130 Capital Drive
Suite C
Golden, CO 80401

Driller Name: **Mike Martin**

License Number: **59374**

Comments: **No Data**

Lithology:
DESCRIPTION & COLOR OF FORMATION MATERIAL

Top (ft.)	*Bottom (ft.)*	*Description*
0	**54**	**Silt & Clays**

Casing:
BLANK PIPE & WELL SCREEN DATA

Dia. (in.)	*New/Used*	*Type*	*Setting From/To (ft.)*
No Data			

IMPORTANT NOTICE FOR PERSONS HAVING WELLS DRILLED CONCERNING CONFIDENTIALITY

TEX. OCC. CODE Title 12, Chapter 1901.251, authorizes the owner (owner or the person for whom the well was drilled) to keep information in Well Reports confidential. The Department shall hold the contents of the well log confidential and not a matter of public record if it receives, by certified mail, a written request to do so from the owner.

Please include the report's Tracking Number on your written request.

Texas Department of Licensing and Regulation
P.O. Box 12157
Austin, TX 78711
(512) 463-7880